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BOSTON SOCIETY OF CIVIL ENGINEERS

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JUL 23 1910

## RULES

Books and periodicals may be used in the Society rooms by members and friends.

Members may borrow books for home use—with the exceptions noted below—but no one shall have more than four books at any time, or keep any book more than two weeks.

Volumes belonging to a set—such as volumes of bound periodicals and of proceedings or transactions of societies—and such other books as the Board of Government may designate, may be taken from the rooms for a limited time only, by special arrangement with the attendant. They shall be subject to recall at any time.

There shall be no immediate renewal of any book on its return to the library.

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A fine of one cent per day per volume shall be charged for over-time, and must be paid before the delinquent can take any more books.

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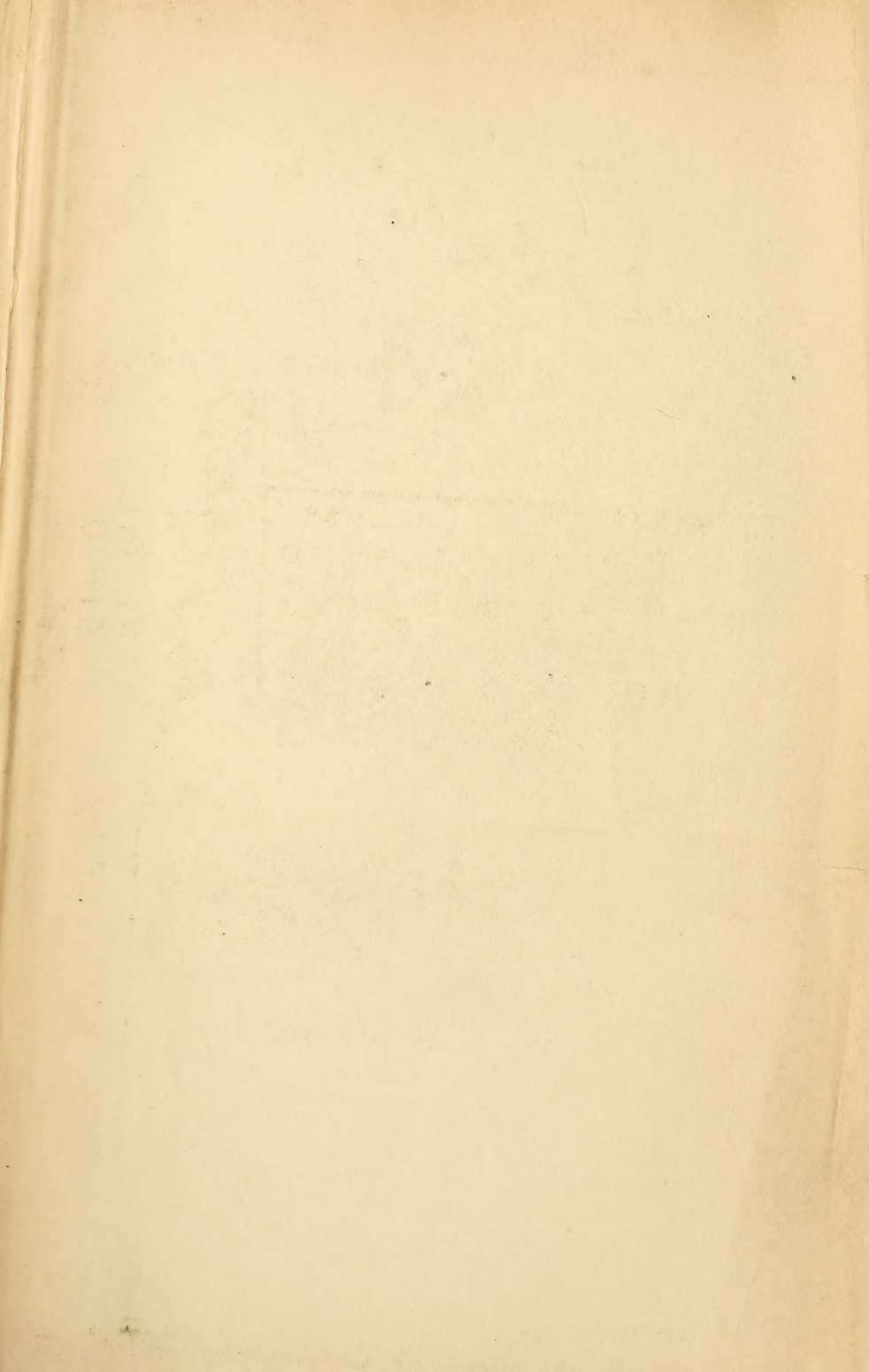
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Any person mutilating or losing a book shall pay for the damage, or replace the book.

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(Revised June 16, 1915.)





\*620.6









**BOSTON SOCIETY OF CIVIL ENGINEERS.**

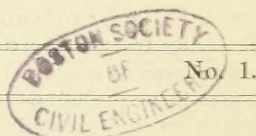
**ORGANIZED JULY 3, 1848.**

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# MONTHLY BULLETIN.

NEW SERIES.

MAY, 1906.



## REGULAR MEETING.

A regular meeting of the Boston Society of Civil Engineers will be held on Wednesday, May 16, 1906, at 7.30 o'clock P. M., in

CHIPMAN HALL, TREMONT TEMPLE, BOSTON.

Prof. Lewis J. Johnson will give an Informal Account of Some Recent Tests of Reinforced Concrete Beams. The talk will be illustrated by lantern slides.

These tests were designed with a view to comparing the efficiency of various methods of web reinforcement. About 150 tests were made.

**BUSINESS OF THE MEETING:** To ballot on the applications for membership as announced in this notice.

S. E. TINKHAM, *Secretary.*

## EXCURSION.

An excursion to the Boston Bridge Works will be made Wednesday afternoon, May 16, 1906, the details of which are given on page 10 of this Bulletin.

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## CANDIDATES FOR MEMBERSHIP.

To be balloted on at meeting May 16, 1906.

HAROLD SHERBURNE BOARDMAN, Orono, Me., (b. 1874). Received the degree of B. C. E. from Maine State College in 1895; spent collegiate years of 1895-6 at Mass. Inst. of Technology and received degree of "Civil Engineer" from University of Maine in 1898. Was tutor in Dept. of Civil Engineering at University of Maine during the collegiate years of 1896-7 to 1898-9; draftsman, Union Bridge Co., Athens, Pa., 1899-1900; draftsman, American Bridge Co., Pencoyd Plant, 1901; returned to University of Maine in fall of 1901 as instructor, was appointed associate professor of civil engineering in 1903 and professor of civil engineering in 1904, which position he now holds. In addition he has been employed in and carried on general engineering work, the nature and dates of which can be given if required. Recommended by G. H. Hamlin, W. H. Sawyer, N. C. Grover and H. K. Barrows.

HORACE PARLIN HAMLIN, Orono, Me., (b. 1883). Received B. S. in Civil Engineering from University of Maine, in 1902; June and July, 1902, transitman on survey of woodland and town property at Montague, Maine; 1902-1903, assistant in civil engineering at University of Maine; June and July, 1903, levelman on hydrographic work at Oldtown, Maine; 1903-1906, instructor in civil engineering at University of Maine; summer of 1905, levelman on base line for U. S. Geological survey, Hydrographic Branch on Kennebec and Androscoggin Rivers. Recommended by G. H. Hamlin, W. H. Sawyer, N. C. Grover and H. K. Barrows.

WILLIAM ELTON MOTT, Brookline, Mass., (b. 1868). Graduate in civil engineering, Mass. Inst. of Technology, 1889; Assistant in civil engineering at Mass Inst. of Tech., 1889-90; June, 1890 to Oct., 1892 engaged in various topographical surveys near Philadelphia, Boston and Montauk, L. I., including six months in office of E. A. Buss, Mill Engineer, Boston; 1892-1900, instructor in civil engineering at Cornell University; 1900-1905, assistant professor, hydraulic engineering, Cornell University; and since Sept., 1905 associate professor, hydraulic engineering, Mass. Inst. of Tech. Recommended by G. F. Swain, C. F. Allen, Dwight Porter and W. S. Johnson.

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## APPLICATIONS FOR MEMBERSHIP.

The following applications for membership have been received, and are now before the Board of Government for approval. Members having information which will assist the government in its consideration of these applications are requested to communicate at once with any member of the Board. Communications will be regarded as confidential and for the use of the Board alone.

WILLIAM TITCOMB BLUNT, Boston, (b. 1855). Graduate in Civil Engineering, Mass. Institute of Technology, 1874; Vacation practice, 1872 and '73; Engineer and Surveyor, U. S. Coast Survey, 1874-5; Secretary and Assistant Engineer, Mass. Harbor and Land Commission, 1875-79; Assistant Engineer, Mississippi River Commission, 1879-83; Engineering and Architectural Construction



at Cleveland, O., 1883-86; U. S. Assistant Engineer under Corps of Engineers, U. S. A. Cleveland District, 1886-90 and 1892-1905; Assistant Engineer Sanitary District, Chicago, 1890 and now Superintendent, George H. Braymann & Bros., Contractors for public works at Boston. Is now a member in good standing of the Toledo Society of Engineers. Recommended by F. W. Hodgdon, H. B. Wood, W. E. McClintock and S. E. Tinkham.

BERTRAM WILLARD RANSON, Boston, (b. 1881). Graduated from University of Michigan, 1904, in Civil Engineering department. Immediately upon graduation went to work for American Bridge Works in Toledo, and remained 9 months. March to June, 1905, L. S. & M. S. Ry. Division Engineers Office, Toledo; June, 1905 to March, 1906, with Trussed Concrete Steel Co., Detroit, and now with W. F. Kearns & Co., Boston. Recommended by J. R. Worcester, E. E. Pettee, O. F. Clapp and W. F. Kearns.

JOHN WILLIAMS STORRS, Concord, N. H., (b. 1858). Educated in public school of Concord, private tutors and a bridge engineering course in Scranton, Pa., schools. With Charles C. Lund, Civil Engineer, and with Foss and Merrill, Civil Engineers, Concord, N. H.; in engineering department of the C. & M. and B. & M. Railroads since 1890 and at present Assistant Engineer B. & M. R. R. Recommended by A. M. Johnson, A. W. Dean, G. G. Shedd and W. B. Howe.

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## MINUTES OF THE APRIL MEETING.

A regular meeting of the Society was held on April 18, 1906 at Chipman Hall, Tremont Temple, at 8 o'clock P. M. President Frank W. Hodgdon in the chair; seventy-two members and visitors present. The record of the last meeting was read and approved.

Messrs. Barzillai A. Rich and John C. Whitney were elected members of the Society.

The Secretary reported for the Board of Government the appointment of the following committees:

*Committee on Excursions:* L. Lee Street, C. T. Fernald, J. O. DeWolf, E. M. Blake and E. E. Pettee.

*Committee on the Library:* F. P. McKibben, F. I. Winslow, H. K. Barrows, F. B. Sanborn and H. J. Hughes.

*Committee on Quarters:* Desmond FitzGerald, E. W. Howe, G. A. Kimball, F. C. Coffin and F. W. Dean.

*Members of the Board of Managers, Association of Engineering Societies:* S. E. Tinkham, *ex officio*, J. R. Freeman, Henry Manley, Dexter Brackett, Dwight Porter and C. W. Sherman.

Mr. Hiram A. Miller was then introduced and spoke on "The General Features of the Charles River Basin and Dam," and gave a Brief Review of the Construction Work to date. The talk was illustrated with lantern slides. In the discussion which followed Messrs. FitzGerald, Rollins and Miller took part.

## SANITARY SECTION MEETING.

At the June meeting of the Sanitary Section, Mr. William F. Morse will read a paper upon the modern methods of garbage disposal which will be illustrated with lantern slides. The matter of uniform sewerage statistics which was discussed at the last meeting will be brought up for further action by the Section and the appointment of a committee for the formulation of standard specification for the manufacture of sewer pipe will be considered.

If suitable arrangements can be made the meeting will be held Saturday afternoon, June 9, and there will be, in connection with the meeting an excursion down the harbor to visit the garbage disposal plant of the city of Boston and other points of interest. It is hoped that it will be possible to invite the ladies to join this excursion.

Notices of the meeting and of the excursion will be issued as soon as the arrangements have been perfected.

WILLIAM S. JOHNSON, *Clerk.*

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## LIBRARY NOTES.

The following are among the most important of the recent accessions to the Library.

- The Modern Asphalt Pavement, by Richards.
- Electric Railways, by Ashe & Keiley.
- Statically-Indeterminate Stresses, by Hiroi.
- Landscape Gardening, by Parsons.
- Modern Turbine Practice, by Thurso.
- Hydrology of the State of New York, by Rafter.
- Berlin-Zossen Railway Tests, by Bell.
- Earth and Rock Excavation, by Perlini.
- Concrete-Steel, by Twelvetrees.
- Cost Data, by Gillette.
- Reports of the Committee of Twenty of the National Fire Underwriters.
- Principal Species of Wood, by Snow.
- Mechanics of Materials, by Merriam.
- Hydraulic Tables, by William & Hazen.
- Hydraulic Motors, by Church.
- Report of Sewage Purification at Columbus, Ohio.

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## CONVENTION OF AMERICAN WATER WORKS ASSOCIATION.

A cordial invitation has been extended to the members of this Society to attend the Annual Convention of the American Water Works Association, to be held in Boston, July 10 to 14, 1906.

Headquarters will be at Huntington Hall, Rogers Building, Mass. Institute of Technology.

Program of the meetings will be given in the next Bulletin



## NEW ENGINEERING WORK.

(Under this head the Excursion Committee proposes to present each month a brief resume of engineering work in progress in New England, as far as such information is readily obtainable. The assistance of members is desired, and items of interest will be gladly received. Such items are intended to include not only works of exceptional magnitude or containing novel features, but also engineering construction work of all kinds and all degrees of magnitude. Notes should be in the hands of the Committee not later than the 2nd Wednesday of each month. The thanks of the Committee are due to the members who have furnished data for the Bulletin.—E. M. BLAKE, Secretary, Excursion Committee, 8 Beacon St., Boston.)

**Commonwealth of Massachusetts.**—**HARBOR AND LAND COMMISSIONERS.**—The dredging of the channel of Annisquam River from Wolf Hill to Gloucester Harbor, 50 feet wide and 6 feet deep at mean low water has been let to the Bay State Dredging Company, and it is expected that work will begin very soon.

The work of building a breakwater of granite quarry grout to protect the anchorage for small boats and fishing boats in Vineyard Haven Harbor has just been commenced.

The work of relocating and marking the boundary line between Massachusetts and Connecticut has also just been commenced.

**Metropolitan Water and Sewerage Board.**—A granolithic finish is being put on the top of Wachusett dam, and some grading and other finishing work is being done.

**Charles River Basin Commission.**—The concrete side walls at the first section of the lower lock gate recess, which were started at about grade 72.6, are now up to about grade 90. They are also putting in concrete in another section, about 40 feet wide and about 40 feet from the first section. At the sluices they are still driving piles, but are nearly through. Piles are also being driven along the walls of both canals and the main basin.

**Metropolitan Park Commission.**—*Charles River Reservation.*—Reinforced concrete and stone masonry arch bridge at Boylston St., Newton Upper Falls. Nearly completed.

*Furnace Brook Parkway.*—Reinforced concrete and stone masonry arch bridge for Granite Branch of the New York, New Haven & Hartford Railroad over Furnace Brook Parkway, West Quincy. Nearly completed.

*Mystic River Reservation.*—Building to sub-grade roads along the Mystic River from High St., Medford and Arlington, to Cradock Bridge, Main St., Medford.

*Nahant Beach Parkway.*—The work of laying about 5,000 square yards of granite block pavement on concrete base in the traffic road near bath-house is in progress.

*Quincy Shore Reservation.*—Building to sub-grade Quincy Shore Reservation from Atlantic St., to National Sailors' Home.

A reinforced concrete bridge for the Quincy Shore drive over Sachem Brook.

*Revere Beach Reservation.*—Grading and surfacing from Revere St. to Saugus River.

**Boston Transit Commission.**—Work is progressing on the Washington-St. Tunnel station entrances at Lagrange St. and Summer St. and on the main structure from about 150 feet north of State St. to Hanover St. Construction will shortly commence on another portion of the main structure, from Hanover St. to Haymarket Sq.

**City of Boston.**—ATLANTIC AVENUE BRIDGE.—The South Boston approach and the wooden draw-pier are completed. The Boston approach viaduct has the lower course of concrete and a portion of the waterproofing in place, and the coping stones are now being set. The bridge spans have the wooden under-floor about completed, ready for waterproofing. This portion is to be paved partly with granite and partly with wooden blocks.

BROOKLINE STREET BRIDGE.—The abutment and side walls to retain the solid filling on the Boston approach are completed, and are now being backfilled. On the wooden bridge the piles are all driven and capped and the trestle bents erected for about  $\frac{2}{3}$  of the length; work is in progress on the flooring. The filling of the Cambridge approach is nearing completion.

CAMBRIDGE BRIDGE.—During the winter plans have been prepared and contracts let for the following work:

Wing walls and upper masonry for the two abutments. Ramp walls for the El. R. R. on Boston approach. Fences and sidewalks for the bridge proper. Plans have also been prepared and bids asked for the four 57-foot towers on the two center piers. The carvings on the center piers are completed and the shelters are being removed. Work is in progress on the relocation of the Cambridge Park wall to make room for First St. to pass under the new bridge and swing around into Main St. On the Boston approach the side walls and ramp walls are being built. Preparations are being made on the approach to connect the surface tracks on the bridge with those on Cambridge St.

**Boston Elevated Railway.**—ELEVATED CONSTRUCTION.—*Forest Hills Extension.*—Foundations for the elevated structure are being constructed on Washington St. south of Green St. On account of the uncertain nature of the soil and the probability of a new and deeper sewer being built in the near future, the foundations are laid deeper than usual, in some cases being 16' to 17' below the surface.

The steel structure is being erected by Mr. C. F. Hall for the Fort Pitt Bridge Works. An entirely new traveler has been erected on the present structure at Guild St. The "A" frame is 55' high, with a mast 16" x 16", and a boom 16" x 16" x 66' of yellow pine. The engine is a Mundy triple drum hoisting engine, with two cylinders 9" x 10" 40 h. p. capacity.

*Sullivan Sq. Car Yard.*—A portion of the steel for the new storage yard is on the ground, and buildings are being removed, preparatory to the commencement of construction work.

**SURFACE LINES.**—Three storage yards for surface cars are being built as follows:—At Salem St. car house in Medford, at the Broadway car house in Everett and at the Cypress St. car house in Brookline.

New special work is being laid at Roxbury Crossing to permit Brookline cars to go direct to Dudley St. Terminal; work is also under way on the new line in Belmont, mentioned in last month's Bulletin.

**New York, New Haven & Hartford R. R.**—**BRIDGES.**—A new four-track bridge 750' long is being built over the Neponset River. A portion of it, about 380', on the southerly side of the river is of pile construction, the balance of the structure being of steel on masonry piers. The latter portion of the bridge is provided with a rolling lift draw span with 50' clear opening. A temporary pile structure is already in place for use during the construction of the new work.

At Readville work is under way upon two reinforced concrete arches, one of 14 feet span and the other of 22 feet span; the latter being a skew span on an angle of 65°. These arches carry the main lines of the Midland Division over yard tracks from the car shops.

The above work is in charge of Mr. A. S. Tuttle, assistant engineer of construction.

Locomotive repair shop is under construction at Readville; for description see Engineering Record of March 10, 1906; work in charge of Mr. F. K. Irwin.

**Boston & Albany R. R.**—**NEWTON CENTRE.**—This work consists mainly of the construction of abutments for four street bridges over the railroad, 2250 linear feet of retaining walls, 500 linear feet of reinforced concrete retaining wall and 1050 linear feet of ditch walls, containing approximately 13,000 yards of concrete masonry. The work is located in the vicinity of Newton Centre Station on the Newton Circuit of the Boston & Albany Railroad.

The abutments and retaining walls will for the most part be constructed in trenches in advance of any steam shovel work. The masonry will first be completed on the north side of tracks the trains meanwhile running single track on the south side. Upon the completion of north side masonry, trains will be run single track on north side and trenches and walls constructed on south side. Upon completion of masonry walls and abutments the Railroad Company will excavate the road bed by means of steam shovels to the new sub-grade. The amount of the masonry contract including excavation for same is approximately \$100,000.

The work of excavation was commenced April 30th and is now progressing at 3 points, viz., Centre St., Newton Centre freight yard and between Cypress St. and Institution Ave. It is expected that concrete masonry will be started at Centre St. about May 8th and will progress at different points as the work is extended.

Some of the unique features of the work are as follows:—

*First*, the size of the Centre St. abutments, which are 300 feet long

and will contain approximately 1200 cubic yards each of concrete masonry.

*Second*, the reinforced concrete wall which will consist of a light curtain wall parallel with the railroad with concrete ribs extending back at right angles for 9 feet. These ribs will support a side track which will deliver coal into the recesses between ribs and thus provide storage for the local coal yard whose present arrangement will be interfered with by the depression work.

*Third*, the method of construction which is somewhat unusual, viz., the trenching for the masonry walls and abutments which will be for the most part entirely below the present surface. This method is made necessary in this case owing to the narrowness of the property lines of the railroad making the bracing of forms difficult if the walls were constructed after the road-bed had been lowered.

The Charles R. Gow Company are executing the masonry contract and the steam shovel work will be done by the Boston & Albany Railroad's own force.

Contract awarded to Benj. Fox of Boston for construction of seven story reinforced concrete warehouse at location of old Passenger Station on Kneeland St. Outer brick and stone walls of old station to be used with the addition in height of about 20 feet of brickwork. Size of building 118 feet x 140 feet. Wooden pile foundations.

**EAST BOSTON, MASS.—*Abolition of Grade Crossings.***—Work started last year will be completed. Additional contracts have been awarded for two pairs of abutments and about 1160 feet of 30" concrete drain. Abutments to be of concrete. Joseph Ross Corp. is the contractor. A steam-shovel and Lidgerwood Rapid-Unloader at work on excavation for roadway. The City of Boston is surfacing Bennington St. and its approaches.

Concrete abutments at isolated places are to be built in the near future as follows:—

Reservoir Road, Newton Highlands Branch.

Maple Grove Sta., P. & N. A. Branch, Adams, Mass.

Cady's Crossings on the main line near East Chatham, N. Y.

Worcester St., Athol Branch, near Indian Orchard, Mass.

**Boston & Maine R. R.**—Work is begun on a new Y. M. C. A. building at Concord, N. H.; cost \$25,000.

Two steel water tanks of 100,000 gal. capacity, for fire protection, are being erected; one for Mystic Wharf 245' 0" high, and one for Hoosac Tunnel Docks 185' 0" high.

Work will soon be started on the abolition of the grade crossing at Sterling Junction. The highway is to be carried over the Boston & Maine tracks by steel trusses, and over the New York, New Haven & Hartford R. R. by a stringer bridge.

At South Acton, Maynard St. is to be carried over the Fitchburg



Division by steel trusses, over the Marlboro branch on a stringer bridge, and over the brook on a masonry arch.

At Ayer, Main St. is to be carried over the Fitchburg Division by steel trusses.

At Lexington, Grant St., the grades are being separated by carrying the railroad over the street on a plate girder bridge.

**Suntaug Lake Tunnel.** — Extension of Peabody Water Supply to Suntaug Lake, involving construction of brick lined tunnel, 1600' long, in section adjoining lake. Tunnel 4' inside diameter, in coarse gravel, constructed through central shaft with compressed air. Water stands 14' deep above tunnel. Will be completed in four to five weeks. F. A. Barbour, Engineer.

**Hartford, Conn.** — Reinforced concrete tunnel being built for Pratt & Whitney. Tunnel is under the N. Y., N. H. & H. R. R. tracks. Size of tunnel 6' x 8' inside. Thickness varying from 8 to 18 inches. Mixture of concrete 1-3-5. Reinforcement; — expanded metal and rods. Eastern Expanded Metal Co. designed and are building this tunnel. Machine shops and foundations being built of reinforced concrete, also new power house and concrete foundations.

**Franklin, Mass.** — Three story Spinning Mill for the Franklin Yarn Co. 150' x 55' made of reinforced concrete. Work done by Eastern Expanded Metal Co.

**Springfield, Mass.** — Five story building being built on Hillman St. All floors and foundations of reinforced concrete.

Eight story building for Forbes & Wallace. All foundations, floors and stairways being built of reinforced concrete. The Eastern Expanded Metal Co. are doing this work.

**Norwich, Conn.** — Norwich Hospital for the Insane. The construction of the reinforced concrete power station, tunnel, bridge, retaining wall and chimney, which Simpson Bros. Corporation have been building for the State of Connecticut, is nearly completed. There are a number of novel features in this work which are of interest to the engineering fraternity.

**Waltham, Mass.** — Simpson Bros. Corporation are putting in the foundation of a reinforced concrete reservoir which they are to construct for the City of Waltham, Mass. The reservoir will have an inside diameter of 100' and will be about 40' in height. It is the third of its character to be constructed in the United States. The contract calls for its completion in about ninety days.

**Northbridge, Mass.** — *Whitinsville Sewers.* — McClintock & Woodfall are constructing five miles of tile sewers this season, from six inches to eighteen inches in diameter. Six acres will be prepared for filter beds, three-quarters of an acre will be prepared for a sludge bed. There will be dosing and settling tanks. The sewers are being laid by D. A. Dorey & Company of Somerville. George W. Carr, of Worcester, has

a contract for the dosing and settling tanks, and also for the concrete work on the filter beds. Most of the work in preparation of the six acres of filter beds will be constructed by the town by day labor. This work will be in condition for inspection in about two months.

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## EXCURSION.

There will be an excursion to the Boston Bridge Works at 3 P. M. on Wednesday, May 16, 1906.

The party will meet at the office of the Works at the corner of Sixth and Binney Streets, East Cambridge.

Take surface cars at Adams Sq. or North Station, marked East Cambridge.

The new shops are built on modern lines. The main building is of steel frame construction with reinforced concrete walls. It covers an area of 65,000 square feet, with a templet-room in the second story 300' x 60'. The Power House, Drafting and General Offices are in brick buildings. Erection plant and the Tool House are located in separate yard.

The receiving yard contains a 100-foot 15 ton electric crane. In the shipping yard there is a 75-foot 30 ton electric crane. The shops are fully equipped with hand and electric cranes of 6 to 15 tons capacity; air hoists and ordinary differential hoists travelling on runs; and surface cars on narrow gage tracks.

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EXCURSION COMMITTEE.

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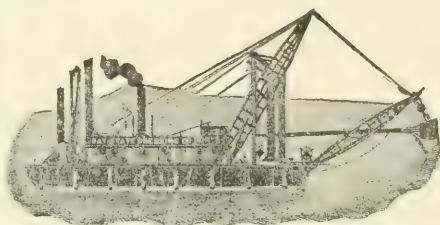
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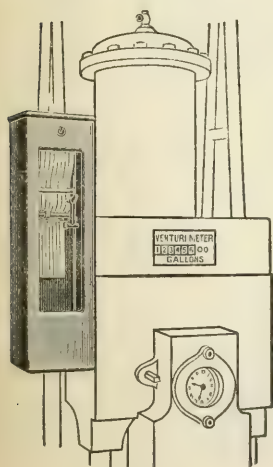
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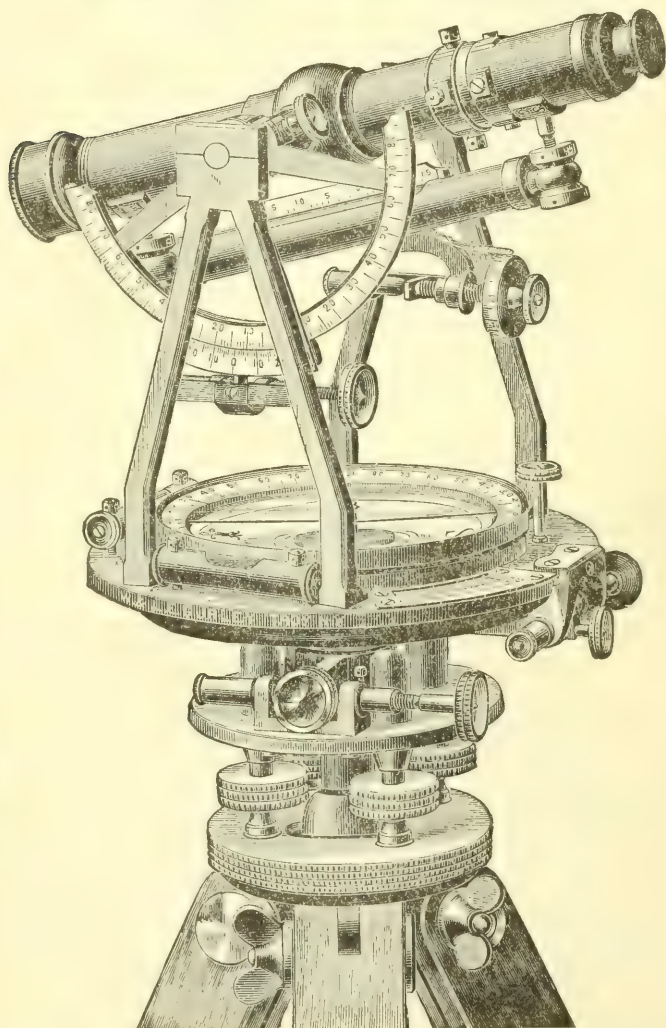
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ORGANIZED JULY 3, 1848.

## MONTHLY BULLETIN.

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NEW SERIES.

JUNE, 1906.

No. 2.

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### REGULAR MEETING.

A regular meeting of the Boston Society of Civil Engineers will be held on Wednesday, June 20, 1906, at 7.30 o'clock P. M., in

CHIPMAN HALL, TREMONT TEMPLE, BOSTON.

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Prof. F. B. Sanborn will read a paper entitled, "Fires and Their Prevention in Factories." The paper will be illustrated by lantern slides.

BUSINESS OF THE MEETING: To ballot on the applications for membership as announced in this notice.

To receive report of committee on Memoir of William T. Pierce.

S. E. TINKHAM, *Secretary.*

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### EXCURSION.

An excursion to the Wood Worsted Mills at Lawrence will be made Wednesday afternoon, June 20, 1906, the details of which are given on page 4 of this Bulletin.



## CANDIDATES FOR MEMBERSHIP.

To be balloted on at meeting June 20, 1906.

**WILLIAM TITCOMB BLUNT**, Boston, (b. 1855). Graduate in Civil Engineering, Mass. Institute of Technology, 1874; Vacation practice, 1872 and '73; Engineer and Surveyor, U. S. Coast Survey, 1874-5; Secretary and Assistant Engineer, Mass. Harbor and Land Commission, 1875-79; Assistant Engineer, Mississippi River Commission, 1879-83; Engineering and Architectural Construction at Cleveland, O., 1883-86; U. S. Assistant Engineer under Corps of Engineers, U. S. A., Cleveland District, 1886-90 and 1892-1905; Assistant Engineer Sanitary District, Chicago, 1890, and now Superintendent, George H. Braymann & Bros., Contractors for public works at Boston. Is now a member in good standing of the Toledo Society of Engineers. Recommended by F. W. Hodgdon, H. B. Wood, W. E. McClintock and S. E. Tinkham.

**BERTRAM WILLARD RANSON**, Boston, (b. 1881). Graduated from University of Michigan, 1904, in Civil Engineering department. Immediately upon graduation went to work for American Bridge Works in Toledo, and remained 9 months. March to June, 1905, L. S. & M. S. Ry. Division Engineer's Office, Toledo; June, 1905 to March, 1906, with Trussed Concrete Steel Co., Detroit, and now with W. F. Kearns & Co., Boston. Recommended by J. R. Worcester, E. E. Pettee, O. F. Clapp, L. C. Wason and W. F. Kearns.

**JOHN WILLIAMS STORRS**, Concord, N. H., (b. 1858).<sup>e</sup> Educated in public school of Concord, private tutors and a bridge engineering course in Scranton, Pa., schools. With Charles C. Lund, Civil Engineer, and with Foss and Merrill, Civil Engineers, Concord, N. H.; in engineering department of the C. & M. and B. & M. Railroads since 1890 and at present Assistant Engineer B. & M. R. R. Recommended by A. M. Johnson, A. W. Dean, G. G. Shedd and W. B. Howe.

## MINUTES OF MEETINGS.

### MAY MEETING OF SOCIETY.

A regular meeting of the Boston Society of Civil Engineers was held on May 16, 1906, at Chipman Hall, Tremont Temple, at 7.50 o'clock P. M., President F. W. Hodgdon in the chair, 98 members and visitors present.

The record of the last meeting was read and approved.

Messrs. Harold S. Boardman, Horace P. Hamlin and William E. Mott were elected members of the Society.

The Secretary read a communication from the Secretary of the American Water Works Association extending an invitation to the members of this Society to attend the annual convention of the Association to be held in Boston, July 10-14, 1906. On motion of Mr. Coffin, it was voted to accept the invitation, and the Secretary was directed to express the appreciation of the Society

for the honor conveyed. The Board of Government was authorized to extend to the Water Works Association such courtesies as seemed to it best.

The Secretary reported for the Board of Government that it had appointed the following as the members of the Committee on Advertisements: The Treasurer and the Secretary of the Society and Mr. F. A. Barbour.

Prof. Lewis J. Johnson then gave an informal account of some Recent Tests of Reinforced Concrete Beams, illustrated by lantern slides. A discussion followed in which Professors Swain and McKibben, and Messrs. Wason, Larned, Thompson and others of the Society took part. Mr. H. W. Telford, of the Engineering Department of Harvard University, supplemented Prof. Johnson's account of the tests made in the laboratory of the University on concrete beams, and Prof. McKibben spoke particularly of tests made at the Mass. Institute of Technology on the shearing strength of concrete cylinders.

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### JUNE MEETING OF SANITARY SECTION.

A regular meeting of the Sanitary Section was held at the Point Shirley Club, Winthrop, Saturday, June 9, 1906.

Horace H. Chase, of Boston, was elected a member of the Section.

The form of Uniform Sewerage Statistics recommended by a special committee at the March meeting and considered at a special meeting of the Section, April 11, 1906, was adopted. It was voted that the printing and distribution of the blank forms be left to the Executive Committee.

Mr. William F. Morse read a paper upon "Modern Methods of Garbage Disposal" which was discussed by the members present.

Previous to the meeting the members visited the plants of the City Refuse Utilization Co. on Atlantic Avenue and of the New England Sanitary Product Company on Spectacle Island and enjoyed a sail around the harbor.

Forty-one members and guests attended the meeting and excursion.

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### APPLICATIONS FOR MEMBERSHIP.

The following applications for membership have been received, and are now before the Board of Government for approval. Members having information which will assist the government in its consideration of these applications are requested to communicate

at once with any member of the Board. Communications will be regarded as confidential and for the use of the Board alone.

RICHARD GARDNER HARTSHORNE, Brookline, Mass., (b. 1881). Educated at Wakefield High School and at Mass. Institute of Technology. Summers of 1901 and 1902 with L. E. Hawes, C. E.; summers of 1903 and of 1904 with Mass. Electric Co., Boston; from Oct., 1904 to June, 1905 assistant in Civil Engineering Department, Mass. Inst. of Technology; from June, 1905 to March, 1906, resident engineer, Penn. Steel Co.; and from March, 1906 to present time resident engineer, New England Structural Co. on N. Y., N. H. & H. R. R. locomotive shops at Readville. Recommended by C. F. Allen, C. B. Breed, L. E. Hawes and F. H. Fay.

EDWARD AUSTIN TUCKER, Winchester, Mass., (b. 1872). Graduate in civil engineering, Mass. Institute of Technology, 1895. With Boston Bridge Works, 1895-6; with Ernest Flagg, New York, 1896-7; with Norcross Bros., 1897-8; and from 1899 to date in private practice as an architectural engineer. Also since 1904 representative of the corrugated bar system of the Expanded Metal and Corrugated Bar Co., St. Louis. Recommended by W. S. Johnson, F. P. McKibben, Leonard Metcalf and W. H. Norris.

## EXCURSION.

There will be an excursion to the Wood Worsted Mills at Lawrence, Mass., on Wednesday afternoon, June 20, 1906.

The party will meet at the North Station at the Information Office and take the 1.15 p. m. train for Lawrence; on arriving there take the electric cars to the mill.

The Wood Worsted Mills of the American Woolen Company were designed by Messrs. Dean and Main, the well known mill engineers of Boston. The buildings are designed to occupy three sides of a square. Mill No. 1 extends along the river and is 1,437 feet long, 123 feet wide, six stories and basement, and contains about 1,200,000 square feet of floor space. It is divided into three sections called A, B and C. Mill No. 2 is parallel with Mill No. 1, and will be the same length. A portion of this building is now being built, the first 105 feet of which is the Office Building, and 395 feet beyond is called Section D. The remaining 937 feet is planned for future construction. Beyond Mill No. 1, near the river, is the power house, planned for forty 225 H. P. boilers, one simple non-condensing engine of about 2,000 H. P. and two double compound condensing engines of 6,000 H. P. There is also a coal pocket with a capacity of 15,000 tons. The buildings are of slow-burning mill construction, with some reinforced concrete work. The transmission of power is by electricity.

Cost of the entire trip will not exceed \$1.30.

EXCURSION COMMITTEE.

## SPECIAL EXCURSION TO PORTLAND, ME.

An invitation from the Portland Stoneware Company through its Boston Manager, Mr. Geo. C. Dunne, has been extended to the Society to visit its works in Portland, Maine, some time during the summer.

The plan suggested contemplates having the members and *ladies* leave Boston on Friday evening, via the Portland Boat, arriving in Portland, Saturday morning, when the party would be taken in charge by the Portland Stoneware Company and pleasantly entertained for the day, returning in time for the night boat for Boston.

The expense of the entire trip should not exceed \$5 for each person. Fare on the boat round trip \$2, single fare \$1.25, state-rooms \$1, \$1.50 and \$2.

In order to secure staterooms in advance and make other necessary arrangements, the Excursion Committee are desirous of having all those who expect to attend, signify their intention by sending the enclosed postal card to E. M. Blake, Secy. of the Committee before July 2, 1906.

The date of this excursion has been fixed for Saturday, Aug. 4, 1906.

## EXCURSION COMMITTEE.

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### LIBRARY NOTES.

#### RECENT ADDITIONS TO THE LIBRARY.

- Andover, Mass., Annual Report Board of Public Works, 1905.
- Baltimore, Md., Report of Water Engineers, 1905.
- Beverly, Mass., Annual Report of Water Board, 1905.
- Clinton, Mass., Annual Report of Water Commissioners, 1905.
- Concord, N. H., Reports of City Engineer and of F. C. Coffin on Sewerage System, 1905.
- Erie, Pa., Annual Report of Board of Water Commissioners, 1905.
- Fall River, Mass., Annual Report of Watuppa Water Board, 1905.
- Hartford, Conn., Annual Report of Water Department, 1905.
- Haverhill, Mass., Annual Report of Water Commissioners for 1905 and of City Officers, 1905.
- Holyoke, Mass., Annual Report of City Engineer for year 1905.
- Holyoke, Mass., Annual Report of Water Commissioners for 1905.



Laconia, N. H., Annual Report of City Departments for 1905.  
 Madison, Wis., Annual Report of Water Department, 1905.  
 Malden, Mass., Annual Report of Water Commissioner, 1905.  
 Manchester, Mass., Annual Report of Board of Water Commissioners, 1905.

Manchester, N. H., Report of Board of Water Commissioners, 1905.

Medford, Mass., Annual Report of City Engineer, 1905.

Middletown, Conn., Annual Report of Water Commissioners, 1905.

New Bedford, Mass., Annual Report of Engineering Department for 1905.

New Bedford, Mass., Annual Report of Water Board, 1905.

New Orleans, La., Semi-Annual Report, Sewerage and Water Board, 1905.

New York City, Report of Board of Water Supply of the City of New York, April, 1906.

Northampton, Mass., Annual Report of Water Commissioners, 1905.

Rutland, Vt., Annual Report of City Officers, 1905.

Salem, Mass., Report of Board of Water Commissioners, 1905.

Springfield, Mass., Annual Report of Board of Water Commissioners, 1905.

Taunton, Mass., Annual Report of Board of Water Commissioners, 1905.

Waltham, Mass., Annual Report of City Engineer and Superintendent of Sewers, 1905.

Ware, Mass., Annual Report of Water Commissioners, 1905.

Wilmington, Del., Annual Report of Board of Park Commissioners, 1905.

Woburn, Mass., Annual Report of Water Department, 1905.

Woonsocket, R. I., Annual Report of Water Commissioners, 1905.

Worcester, Mass., Annual Report of Superintendent of Sewers, 1905.

Worcester, Mass., Annual Report of Water Commissioner and City Engineer, 1905.

Massachusetts, Annual Report R. R. Commissioners, 1905 ; Annual Report Metropolitan Water and Sewerage Board, 1906.

New Jersey, Annual Report Commissioners of Public Roads, 1905 ; Annual Report, State Board of Health, 1905.

Ohio, Annual Report State Board of Health, 1905.

Rhode Island, Annual Report State Board of Public Roads, 1905 ; Annual Report Commissioners of Dams and Reservoirs, 1905.

United States, Report of Board of Consulting Engineers; Panama Canal, 1906; Panama Canal, Testimony of John F. Wallace before Senate Committee; Annual Report, Interstate Commerce Commissioners, 1905.

Society of Naval Architects and Marine Engineers, Transaction, 1905.

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List of periodicals received regularly by the Society, which may be found on file in the Library.

American Institute of Mining Engineers, Bi-Monthly Bulletin.

American Institute of Electrical Engineers, Proceedings.

American Society of Civil Engineers, Proceedings.

Association of Engineering Societies, Journal.

American Architect and Building News.

American Engineer and Railroad Journal.

American Gas Light Journal.

Cassier's Magazine.

Clay Worker.

Clay Record.

Deutsche Bauzeitung.

Engineering News.

Engineering Record.

Engineering Review (London).

Engineering Magazine.

Engineers' Society of Western Pennsylvania, Proceedings.

Engineer, The (London).

Engineering (London).

Electrical World.

Elektrotechnik und Maschinenbau.

Electrical Magazine (London).

Franklin Institute, Journal.

Forestry and Irrigation.

Harvard Engineering, Journal.

Iron and Steel Magazine.

Iron Age.

Irrigation Age.

Memoires de la Societe des Ingenieurs Civils de France.

Massachusetts Highway Association, Journal.

Municipal Engineering.

Mechanical Engineer.

New England Water Works Association, Journal.

Page's Weekly.

Polytechnic, The.

Railroad Gazette.  
 Railway Age.  
 Railway and Engineering Review.  
 Review of Reviews.  
 Revue de L'Ingenieur et Index Technique (Brussels).  
 Royal Scottish Society of Arts, Journal.  
 Rose Technic.  
 School of Mines, Quarterly, Columbia University, N. Y.  
 Street Railway Bulletin.  
 Society of Arts, Journal.  
 Stevens Institute Indicator.  
 Scientific American.  
 Street Railway Review.  
 Technology Quarterly.  
 Technology Review.  
 Technologist, The.  
 University of Kansas, Bulletin.  
 University of Wisconsin, Bulletin.  
 Western Society of Engineers, Journal.  
 Zeitschrift des Osterreichischen Ingenieur-Und Architekten-  
 Vereines.

## CONVENTION OF AMERICAN WATER WORKS ASSOCIATION.

A cordial invitation has been extended to the members of this Society to attend the Annual Convention of the American Water Works Association, to be held in Boston, July 10 to 14, 1906.

Headquarters will be at Huntington Hall, Rogers Building, Mass. Institute of Technology.

### PROGRAM OF THE CONVENTION.

Tuesday, July 10, 1906, at 10 A. M. Reception and welcome by local committee, through the Governor, the Mayor and Presidents of Mass. Institute of Technology, New England Water Works Association and Boston Society of Civil Engineers.

The afternoon and evening session will be devoted to reading of papers.

Wednesday, July 11th. Morning and afternoon sessions for the reading of papers. In the evening a trip will be made to "Wonderland."

Thursday, July 12th. Morning sessions for the reading of papers. Afternoon trip down the Harbor, and evening theatre party.

Friday, July 13th. Morning, afternoon and evening sessions for reading of papers.

Saturday, July 14th. Trip to Wachusett Dam or to Lexington, as members choose. At evening session description of the dam illustrated with lantern slides.

Some twenty odd papers have been prepared for the convention, and are as follows:—"A Symposium on the Chicago Drainage Canal Case; Opening paper, by Dr. W. P. Mason; "Self Purification of the Mississippi River during the latter part of its course," Mr. Robert Spurr Weston; "Sewage Disposal Works in their relation to water supply," Mr. M. N. Baker; "Stream Pollution," Mr. M. O. Leighton; "The Greatest Typhoid Fever Epidemics," Dr. George A. Soper; "Extensions and Improvements in the Supply Main, Yarmouth, N. S.," Mr. George H. Robertson; "Copper Sulphate Results," Prof. James M. Caird; "A Pictorial Appeal, Water Works too," Mr. H. F. Dunham; "Water Softening for Municipal Supplies," Mr. George W. Fuller; "The Growth of the Pumping Station," Mr. Charles A. Hague; "Disinfection as A Means of Water Purification," Mr. George C. Whipple; "Necessity of Sealing Meter Connections," Mr. F. C. Kinsbury; "Expanding Water Supply System," Mr. J. T. Fanning; "Notes on Comparative Efficiency of Cast Iron and Riveted Pipe," Mr. L. J. LeConte; "The Lancaster Filter Plant," Mr. P. A. Maignen. "Coal Burning," Prof. C. H. Hurd; "A Retrospect of an Arbitration on the Value of a Water Works," Mr. Albert H. Wehr; "Pump Slipage," Mr. Alba L. Holmes; "The Simplex Water Meter," Mr. J. W. Ledoux; "Lake Cheesman Dam," Mr. George T. Prince; "Description of Metropolitan Water Works," Mr. Dexter Brackett; besides papers by Profs. Gardner S. Williams, H. L. Russell, E. O. Jordan, Adolph Gehrman and Mr. John W. Hill.

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## NEW ENGINEERING WORK.

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(Under this head the Excursion Committee proposes to present each month a brief resume of engineering work in progress in New England, as far as such information is readily obtainable. The assistance of members is desired, and items of interest will be gladly received. Such items are intended to include not only works of exceptional magnitude or containing novel features, but also engineering construction work of all kinds and all degrees of magnitude. Notes should be in the hands of the Committee not later than the 2nd Wednesday of each month. The thanks of the Committee are due to the members who have furnished data for the Bulletin.—E. M. BLAKE, Secretary, Excursion Committee, 8 Beacon St., Boston.)

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**Commonwealth of Massachusetts.**—HIGHWAY COMMISSION.—The State highway work is now being done in the following cities and towns:



Bellingham	Grafton	Southboro
Beverly	Holden	Templeton
Blackstone	Kingston	Wareham
Boxboro	Lee	Westfield
Chatham	Lenox	West Newbury
Dracut	Lynn	West Springfield
Gloucester	Palmer	

**Charles River Basin Commission.**—At the lower gate recess the concrete side walls are nearly up to the top. The floor of the lock is laid for about two-thirds of the length of the lock. At the sluices the cofferdam is closed in and the filling is now being put in. The contractor is getting his concrete plant ready for work on the sluices.

The Legislature has authorized the Commission to build the embankment along the Charles River, starting at the Cambridge bridge and extending to the Back Bay Fens. It will be one hundred feet wide back of Beacon St. and nearly three hundred feet wide back of Brimmer St.

**Metropolitan Park Commission.**—*Charles River Reservation.*—Reinforced concrete and stone masonry arch bridge at Boylston St., Newton Upper Falls. Nearly completed.

*Furnace Brook Parkway.*—Reinforced concrete and stone masonry arch bridge for Granite Branch of the New York, New Haven & Hartford Railroad over Furnace Brook Parkway, West Quincy. Nearly completed.

For surfacing and finishing Furnace Brook Parkway from Adams St. to Blue Hills Reservation.

*Mystic River Reservation.*—Building to sub-grade roads along the Mystic River from High St., Medford and Arlington, to Cradock Bridge, Main St., Medford.

The making of molded concrete blocks to be used in the construction of bridge over Mystic River, near Armory.

Bids have just been received for construction of reinforced concrete bridge over Mystic River, near Armory. Work will probably begin immediately.

*Quincy Shore Reservation.*—Building to sub-grade Quincy Shore Reservation from Atlantic St. to National Sailors' Home.

A reinforced concrete bridge for the Quincy Shore drive over Sachem Brook.

*Revere Beach Reservation.*—Grading and surfacing from Revere St. to Saugus River. Nearly completed.

**Harbor and Land Commission.**—Dredging of channel in Annisquam River, Gloucester, including the reconstruction of sea walls, and at the same place the County Commissioners of Essex

County are rebuilding the bridge over the dredged channel at Western Avenue. At the present time the concrete abutments for the bridge are under way and the bridge itself is to be a Scherzer rolling lift bridge with a very sharp skew.

The construction of the breakwater in Vineyard Haven Harbor about 600 feet long is in progress. It consists of a ridge of granite quarry grout, projecting about 2 feet above mean high water, 5 feet wide on top with slopes of 1 1-2 to 1.

The work of constructing two stone jetties at the entrance to Cuttyhunk Pond on the island of Cuttyhunk will be commenced shortly. The jetties are to consist of ridges of stone 5 feet wide on top with slopes of 1 1-2 to 1, the top to vary from mean high water to 3 feet above mean high water.

**Boston Transit Commission.**—Work is progressing on the Washington-St. Tunnel station entrances at Lagrange St. and Summer St. and on the main structure from about 150 feet north of State St. to Haymarket Sq.

**City of Boston.**—ENGINEERING DEPARTMENT.—*Northern Avenue Bridge.*—The concrete foundation for the centre bearing pier for the draw has been completed and the concrete foundation of the channel pier on the Boston side is nearly finished. The dredging for the foundation of the Boston abutment has been done and work is in progress on the pile and concrete foundation of that abutment. The timber draw pier, nearly 600 feet long and 88 feet wide is finished with the exception of a small amount of planking.

**New York, New Haven & Hartford R. R.**—The temporary bridge at Neponset has been put into service and the Contractors for the Sub-Structure, Messrs. Holbrook, Cabot & Rollins, are now at work tearing out the old bridge.

Plans and specifications are now being prepared for double tracking the bridge over the Taunton River at Somerset, Mass. This will require the construction of a center pier and two rest piers for a steel pivot Draw Bridge, giving 100 feet draw channels on each side of the center pier, and also the construction of about 1,200 feet of trestle approach to the Draw Bridge.

Elimination of Grade Crossings at Attleboro, Mass., consisting of six overhead bridges and one track bridge completed with abutments of concrete masonry, and five stone arched bridges and one steel span with concrete abutments now under construction one-half of each having been completed and the tracks relocated at the higher level.

Construction of the new line from West Roxbury to Needham, Mass., including eighteen bridges of concrete masonry, five being reinforced concrete arches, all completed except one pair of

highway abutments and two concrete arches. Rock cut containing over 100,000 cubic yards being handled by machinery.

**Boston Elevated Railway** — ELEVATED CONSTRUCTION.—*Forest Hills Extension.*—Foundations for the elevated structure are being constructed on Washington St. south of Lotus Place. On account of the uncertain nature of the soil and the probability of a new and deeper sewer being built in the near future, the foundations are laid deeper than usual, averaging 12 feet below the surface.

The steel structure is erected as far as Kingsbury St. and riveted complete to Dale St.

A compressor mounted on the steel structure and following the work furnishes air for six pneumatic riveting machines.

*Sullivan Sq. Car Yard.*—A portion of the steel for the new storage yard is on the ground, buildings are being removed and foundations are built west of Arlington Ave.

**SURFACE LINES.**—In East Boston a temporary trestle is being constructed over the Boston & Albany R. R. at Saratoga St. to carry surface tracks, while the work incidental to the abolition of grade crossings is in progress.

New track of 9-inch girder rail (125 lbs.) of the Boston Elevated Ry. Co. section is being laid on Dorchester Ave., from Fields Corner to Park St., and on Mt. Auburn St., Cambridge.

Storage yards for surface cars at Broadway, Everett; Salem St., Medford; and Cypress St., Brookline, are nearly completed.

**Attleboro, Mass.**—A three-story and basement factory building entirely of reinforced concrete. The building is 155' x 40'. Work just started.

**Hartford, Conn.**—The Aberthaw Construction Co. are building a ten-thousand and a two-thousand ton coal pocket for W. C. Mason & Co., retail coal dealers. Both structures are of reinforced concrete, designed so as to shoot the coal directly into teams. Adolph Suck of 179 Summer St., Boston, Engineer.

**Lawrence, Mass.**—A filter tank for Arlington Hills is underway; concrete work just started.

At Cumberland Mills, the Aberthaw Construction Co. are completing a reinforced concrete spark arrester, with stack running up one hundred feet, 11-foot flue.

**Brookline, Mass.**—Garage at Brookline Village, opposite transfer station. Concrete girders and piers support the front walls; floors figured at 150 lbs. per square foot live load. The only specially interesting feature of this work is the main girders 48" deep, which have clear span of 34 feet.

**Quincy, Mass.**—The Boston Consolidated Gas Company have awarded the contract for building a concrete gas holder in

Quincy to P. B. Elkins Co. The holder is constructed of reinforced concrete about 100 feet in diameter, and 28 feet high. Mixture of concrete 1—2—4.

**Brookline, Mass.**—The town of Brookline is about to commence the building of a covered brook channel across the land of Henry M. Whitney in Brookline. The channel is to be constructed entirely of concrete 850 feet long, 8 feet wide and 7 feet high. The type is basket handle. The contract has been awarded to M. J. O'Hearn.



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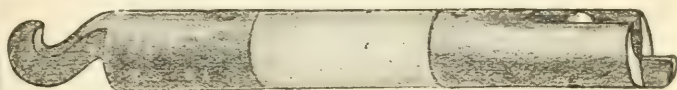
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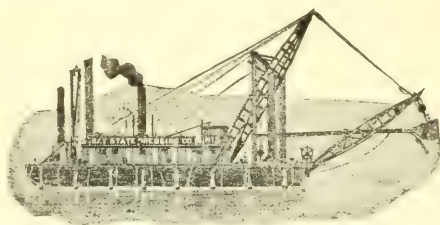
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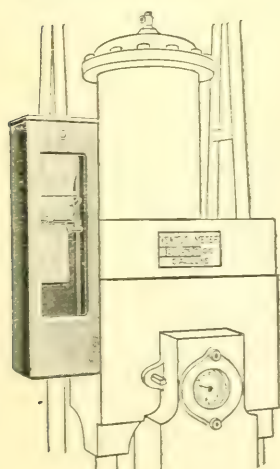
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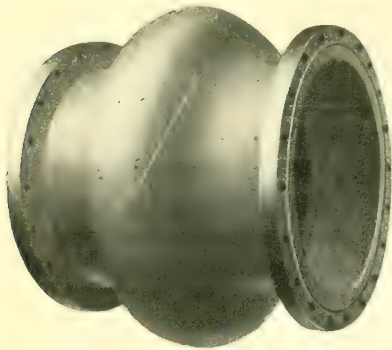
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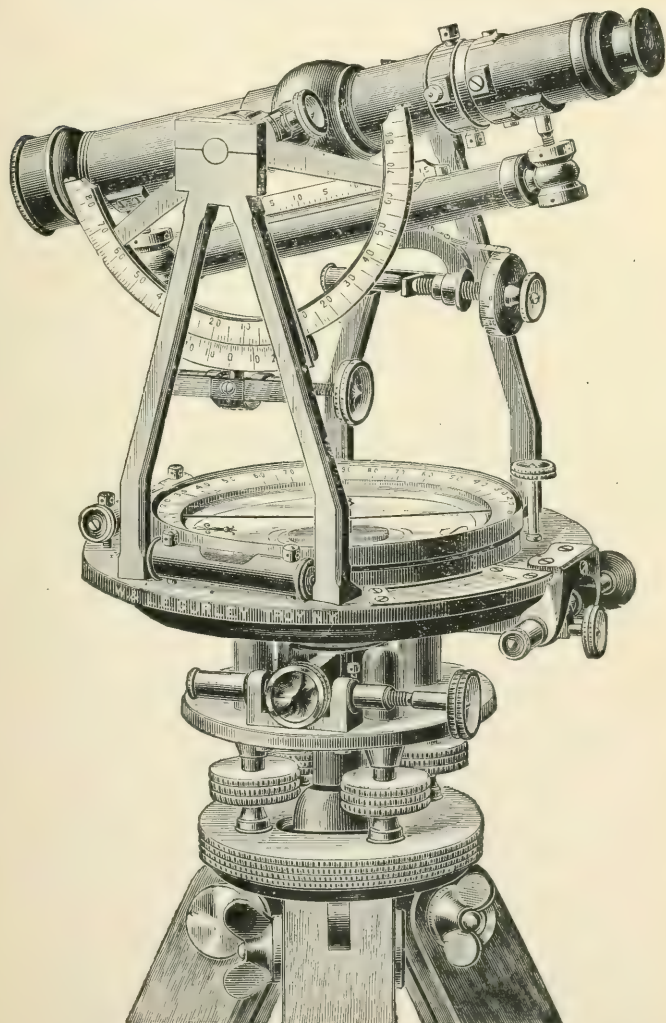
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## **MONTHLY BULLETIN.**

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NEW SERIES.

JULY, 1906.

No. 3.

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### **EXCURSION ON JULY 25, 1906.**

There will be an excursion to The Blake & Knowles Steam Pump Works on Wednesday, July 25, 1906.

This plant is situated on Third St. (between Binney and Bent Sts.), East Cambridge, Mass., and covers an area of approximately seven acres, consisting of Machine Shops, Iron and Brass Foundries, Pattern Shop, Blacksmith Shop, Storage Buildings, etc.

At these works are built all kinds and types of pumping and hydraulic machinery, specialties for marine service, auxiliaries for steam turbine equipments, pumps for sugar houses, and regular trade pumps.

These works employ about 1,500 men. The Iron Foundry melts from 50 to 60 tons each day.

Members will meet at the plant at 3 o'clock P. M. Take surface cars at Scollay Sq. marked "Harvard Sq." or surface cars at the North Station marked either "Harvard Sq." or "Spring Hill." In either case get off at Third St., East Cambridge.

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### **EXCURSION TO PORTLAND, AUG. 3-5, 1906.**

#### **ITINERARY OF EXCURSION.**

Leave Boston Friday evening, August 3, at 7 P. M., on Steamer "Bay State," reaching Portland the following morning.

The Portland Stone Ware Co. have arranged to entertain the party during Saturday, August 4, as follows:—Special cars will be at the boat to conduct the party to one of the hotels for



breakfast, after which the works of the Company will be visited, the ladies being entertained otherwise during this time.

After inspecting the works, cars will again be boarded and the party conducted to one of the harbor boats for a sail down Casco Bay, stopping at one of the island hotels for dinner. The excursion will arrive back in Portland in time for the Boston boat sailing at 7 p. m.

There are numerous side trips which can be taken at a small expense for those who desire to remain in Portland over Sunday, among them being a trip to the Fabyan House, White Mountains. Round trip ticket, \$1.50. Trains on the Maine Central R. R. leave Portland at 9.30 a. m., and arrive at Fabyan at 12.50 p. m. Returning, leave Fabyan at 2.15 p. m., and arrive at Portland at 5.35 p. m.

Boat for Boston sails at 7 p. m.

Staterooms on Steamer "Bay State" have been engaged for the trip from Boston to Portland for August 3, and will be held until July 25. The price for a stateroom each way is \$1.50. Stateroom may be used and the expense shared by two persons. Fare by boat each way, \$1.25, or round trip, \$2.00. Members are requested to secure such tickets and staterooms as they desire at once by sending check or money order to the Secretary, E. M. Blake, 8 Beacon St., for the proper amount. For ticket to Portland only, \$1.25; for round trip ticket, \$2; for ticket to Portland and a stateroom, \$2.75; for round trip ticket and a stateroom, \$3.50. Tickets and stateroom checks will be mailed immediately on receipt of the money. State clearly in your order exactly what tickets are desired. Staterooms have been engaged for the return trip on both August 4 and August 5, but members must purchase their own checks at Portland.

Accommodations can probably be obtained up to July 25 for members who have not already applied, but they are urged to send their orders in at once.

#### **EXCURSION COMMITTEE:**

L. L. STREET, *Chairman.*

C. T. FERNALD.

E. E. PETTEE.

J. O. DEWOLF.

E. M. BLAKE, *Secretary.*

# LIBRARY NOTES.

## BOOK REVIEWS.

*The Modern Asphalt Pavement.* By Clifford Richardson, Director New York Testing Laboratory, Long Island City, N. Y. Published by John Wiley and Sons, New York, 1905. Cloth. 580 pp., with illustrations.

It is safe to say that this book of 580 pages contains more information concerning Asphalt and Asphalt Pavements, as laid in this country, than can be obtained from all other sources combined. Mr. Richardson has spent many years in the study of the subject, and as Chemist and Adviser of the so-called Asphalt Trust has had great opportunities to acquire exact knowledge of the Asphalts used for pavements, and this knowledge, hitherto unavailable, he has given to the public in his book.

The book is divided into nine parts, each dealing with a definite division of the general subject. Part one deals with the base and the intermediate course in an admirable manner; and in the second part, which concerns the materials constituting the asphalt surface mixtures, much information is given concerning sands and gravels in addition to the asphaltic component. Part three gives the sources from which the native Asphalts in use in the paving industry are obtained, the extent of the deposits and the qualities of each variety, and is a storehouse of asphaltic knowledge. With part four we come to the preparation of the surface mixture; and in part five to its handling and placing on the street. The physical properties of the finished pavements are considered in the sixth part. The seventh part relates to specifications; the eighth part to defects in Asphalt Pavements; and the ninth and last to the best methods of scientific inspection and control.

The book is clearly and attractively written and is eminently readable.

Mr. Richardson has been accused of holding a brief for Trinidad Asphalt in the competition between the many varieties of Asphalt used for pavements. Indeed, he frankly says that Trinidad Lake Asphalt is the best of all, for many excellent reasons, which he gives, and which he summarizes by saying that it requires less skill to lay and will stand more abuse than any other. In this as in other controverted phases of the subject, his statements are fair and clear, but the reader must bear in mind that others hold and have expressed opinions which do not always coincide with our author's views.

The title of the book assumes too much. The whole subject of Foreign Rock Asphalt which is used for paving large areas in many cities in Europe, and which is practically the only kind in

use there, is given only two pages of space at the end of chapter xii and is not recognized as a branch of the subject either in the table of contents or in the index. It concludes with the statement that "Continental Rock Asphalts are now used in this country almost solely in Mastics, the extreme slipperiness of the pavements made with them having proved so objectionable in comparison with the Asphaltic Sand Pavement that the former are no longer tolerated." The experience of Boston, which has about eight miles of Foreign Rock Asphalt paved streets, out of a total of about twenty miles of Asphalt streets of all kinds, does not bear out this assertion in any particular.

The book is largely a scientific examination of the properties of natural Asphalts and of their behavior in the Laboratory and when used for pavements, and the author in the preface has given a guide as to what the average reader may skip to advantage in reading it.

An admirable feature of the book is a short summary at the end of each chapter, and the engineer who reads these summaries only will, with little labor, acquire a very good idea of the subject of Asphalt Pavements in America.

HENRY MANLEY.

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*Mechanics Problems for Engineering Students.* By Frank B. Sanborn, Professor of Civil Engineering in Tufts College. Second Edition, Revised and Enlarged. Pp. 194. Illustrated. 5½ x 8 ins. Cloth. 1906. Published by John Wiley and Sons.

[Donated by the Publishers.]

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We confess that we should stand considerably in awe of an engineer who could successfully solve all of the six hundred problems between the covers of this book.

The problems exhibit marked ingenuity and power of imagination and appear to be what the preface indicates: of a practical nature and such as for the most part might occur in engineering practice.

They are suggestive, and the volume reminds one of a somewhat similar but very much less comprehensive work written by Herbert Spencer's father about seventy years ago entitled *Inventive Geometry*.

While Professor Sanborn's work cannot be said to be absolutely indispensable to every civil engineer, no mistake would be made in purchasing it, as it contains many problems similar to those which must occasionally at least be met and solved by the engineer.

The problems are grouped under the three general subjects

of Work, Force and Motion. Several solutions throughout the book illustrate the methods to be used, and there are many diagrams and photographic reproductions of machines, etc., which add interest to the problems.

F. I. WINSLOW.

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*Treatise on Mine Surveying.* By Bennett H. Brough. Eleventh Edition, Revised. Pp. 372. Illustrated. 5 x 7½ in. Cloth. London, 1904. Charles Griffin & Co., Ltd.

[Donated by J. B. Lippincott Company.]

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Contents: This is a text book designed primarily for students, and embodies the substance of the course of instruction in Mine Surveying given at the Royal School of Mines (London). The surveying of collieries and metal mines is treated as a common subject. The methods in use in England and in the Continent appear to be very fully described, and some mention is made of American practice. It includes chapters describing special applications of the magnetic needle and on photographic surveying. The Appendix contains a Bibliography of the principal treatises on the subject.

To an American engineer the chief interest of the book will be for purposes of reference. It gives brief account of the methods applied to the solution of various problems in different parts of the world. The author recognizes the excellence of American practice, but his description of details is disappointingly brief.

W. SPENCER HUTCHINSON,

*Mining Engineer.*

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#### RECENT ADDITIONS TO THE LIBRARY.

Fall River, Mass., Annual Report of City Engineer, 1905.

Fitchburg, Mass., Annual Report of Water Commissioners, 1905.

Lowell, Mass., Annual Report of Water Board, 1905.

Marlboro, Mass., Annual Report of Water Department, 1905.

Newton, Mass., Annual Report of City Engineer, 1905.

Springfield, Mass., Annual Report of City Engineer, 1905.

St. Paul, Minn., Annual Report of Water Commissioners, 1905.

New York Barge Canal, Annual Report, Board of Consulting Engineers, 1906.

Michigan, Annual Report, Board of Health, 1904.

Connecticut, Annual Report, Board of Health, 1905.

Massachusetts, Metropolitan Water and Sewerage Board, Annual Report, 1905.



U. S. Geological Survey, Geology and Water Resources of Panhandle of Texas, 1906.

American Society of Mechanical Engineers, Transactions, Vol. 26, 1905.

American Institute of Mining Engineers, Transactions, Vol. 36, 1905.

Institution of Mechanical Engineers (London), Proceedings for 1905, Parts 3-4.

General Specifications for Steel R. R. Bridges, by Theo. Cooper, Ed. of 1906.

Mechanics Problems, by Prof. F. B. Sanborn.

Treatise on Mine Surveying, by Bennett H. Brough.

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## NEW ENGINEERING WORK.

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(Under this head the Excursion Committee proposes to present each month a brief resume of engineering work in progress in New England, as far as such information is readily obtainable. The assistance of members is desired, and items of interest will be gladly received. Such items are intended to include not only works of exceptional magnitude or containing novel features, but also engineering construction work of all kinds and all degrees of magnitude. Notes should be in the hands of the Committee not later than the 2nd Wednesday of each month. The thanks of the Committee are due to the members who have furnished data for the Bulletin.—E. M. BLAKE, Secretary, Excursion Committee, 8 Beacon St., Boston.)

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**United States Government.**—RIVERS AND HARBORS.—*Contracts Recently Let.*—Four contracts of 1,875,000 cubic yards each for dredging 35 foot channel, 540 feet wide, from Charles River and Chelsea Bridge to Presidents Roads.

Four contracts of 570,000 cubic yards each for dredging 35 foot channel, 675 feet wide, from Presidents Roads to Broad Sound.

One contract for removing ledge in upper Main Ship Channel, 16,555 cubic yards.

Upper Mystic River dredging channel 4 feet deep at low water and Malden River channel 12 feet deep at high water.

In Chelsea Creek 18 feet at high water.

In Weymouth Fore River 18 feet at low water.

In Lynn Harbor 15 feet at low water.

Sandy Bay Breakwater, Rockport, Mass., depositing 300,000 tons rubble stone.

At Newburyport depositing 28,000 tons in North jetty.

In Merrimac River at Haverhill dredging 28,000 yards, making channel 7 feet deep at low water.

**Commonwealth of Massachusetts.**—METROPOLITAN PARK COMMISSION.—*Furnace Brook Parkway.*—Surfacing and finish-

ing Furnace Brook Parkway from Adams Street to Blue Hills Reservation.

*Mystic River Reservation.*—Building to sub-grade roads along the Mystic River from High St., Medford and Arlington, to Cradock Bridge, Main St., Medford.

The making of molded concrete blocks to be used in the construction of bridge over Mystic River, near Armory.

Reinforced concrete masonry bridge over Mystic River, near Armory, Medford.

*Quincy Shore Reservation.*—Building to sub-grade Quincy Shore Reservation from Atlantic St. to National Soldiers' Home.

A reinforced concrete bridge for the Quincy Shore drive over Sachem Brook.

*Revere Beach Reservation.*—Grading and surfacing from Revere St. to Saugus River. Nearly completed.

HARBOR AND LAND COMMISSIONERS.—Work on Cuttyhunk jetties is progressing.

CHARLES RIVER BASIN COMMISSION.—Concrete side walls of Lock for about one-third of the length are within a few inches of the top. Bottom of Lock is complete for some three-fourths of the length. In all the contractor has placed some 13,500 cubic yards of concrete. The coffer-dam for the sluices has been pumped out, and grading is in progress preparatory to laying the concrete.

**City of Boston.**—ENGINEERING DEPARTMENT.—*Atlantic Avenue Bridge*, over the Yard of the Boston Terminal Company and Fort Point Channel.—The flooring of the fixed spans is nearly completed and the laying of the wood block pavement upon the spans over the railroad yard is in progress.

*Brookline Street Bridge*, over Charles River at Cottage Farm.—H. P. Converse & Co., contractors for the steel superstructure, have commenced the erection of the two steel spans over the tracks of the Grand Junction Branch of the Boston & Albany R. R.

**Boston Transit Commission.**—Work is progressing on the Washington-St. Tunnel station entrances at Lagrange St. and Summer St. and on the main structure from about 150 feet north of State St. to Haymarket Sq.

**Boston & Albany Railroad.**—ABOLITION OF GRADE CROSSINGS.—*Newton Centre.*—This contract is let to the C. R. Gow Company, and was described in the May Bulletin. The walls are to be laid in trenches and the excavated material taken on cars to Riverside and unloaded. The north abutment at Centre St. and Langley Road and a few smaller walls are nearly finished, completing three-fourths of the work on the north side. At Riverside the contractor has established a gravel screening plant, using a

clam shell bucket for digging. Concrete mixing plants have been built on flat cars, which are moved forward on construction tracks as the work progresses.

*East Boston.*—Work on the masonry for the abutments at Maverick St. and grading by Joseph Ross Company are nearly finished. About two-thirds of the new rails are in place in the new freight yard, which has been laid out by the Railroad Company.

*Reservoir Road, Brookline.*—This contract is let to McCarthy & Wellington of Boston. Excavation for the two abutments is finished and ready for the foundations.

MISCELLANEOUS.—*Indian Orchard, Mass.*—Excavation is being made for concrete abutments at Worcester St. bridge on the Athol Branch.

*Maple Grove, Adams, Mass.*—A new station is to be built at this point, and excavation for foundations is in progress. John Donahue of Springfield is the contractor for work at both places.

*East Boston.*—Preliminary operations for the new pier at Clyde St. have begun. The old buildings have been removed, preparatory to putting in new work. A new building 589' x 180' is to be constructed at this point.

*Kneeland St. Warehouse.*—The brick walls of building are shored up, and old pier foundations are being reinforced by driving additional piles. The entire exterior of the building is to be reconstructed with reinforced concrete. This work, presenting many interesting features, is being done by Benjamin Fox of Boston as contractor.

**Boston Elevated Railway.**—ELEVATED CONSTRUCTION.—*Forest Hills Extension.*—Steel structure is erected nearly to Townsend St. The erection takes place from 12 o'clock midnight until 5 A. M., during which time the operation of surface cars on Washington St. is discontinued.

*Sullivan Sq. Car Yard.*—Mr. C. F. Hall has begun erecting the steel for the elevated car yard, work being carried on during the day time.

**SURFACE LINES.**—The new auxiliary power station at Clarendon Hills is in operation, and fully meets guarantees for economy and output. A similar station on Salem St., Medford, is very nearly completed. Power is generated by gas engines of the American-Crosby and De La Vergue type. Gas producers of the Loomis-Pettibone type are installed in connection with these engines for furnishing supply of gas.

New line to Belmont Station, via Huron Ave., Bright St. and Concord Ave., was opened June 23.

Chelsea St. bridge is being strengthened to permit of large

tunnel cars being operated on the new line to Chelsea via Central Ave.

**New York, New Haven & Hartford R. R.**— Plans and specifications are now being prepared for double tracking the bridge over the Taunton River at Somerset, Mass. This will require the construction of a centre pier and two rest piers for a steel pivot draw bridge, giving 100 feet draw channels on each side of the centre pier, and also the construction of about 1,200 feet of trestle approach to the draw bridge.

Elimination of grade crossings at Attleboro, Mass., consisting of six overhead bridges and one track bridge completed with abutments of concrete masonry, and five stone arched bridges and one steel span with concrete abutments now under construction, and the tracks relocated at the higher level.

Construction of the new line from West Roxbury to Needham, Mass., including eighteen bridges of concrete masonry, five being reinforced concrete arches, all completed except one pair of highway abutments and two concrete arches. Rock cut containing over 100,000 cubic yards being handled by machinery.

**Pawtucket, R. I.**— Bids were opened on July 9 for a new 15-million gallon pumping engine to be erected in a new pumping station near the present Station No. 1, which can be seen from the main line of the N. Y., N. H. & H. R. R. Percy M. Blake, C. E., is the consulting engineer.



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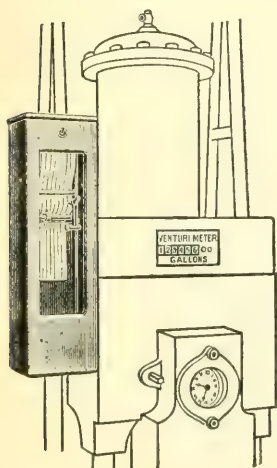
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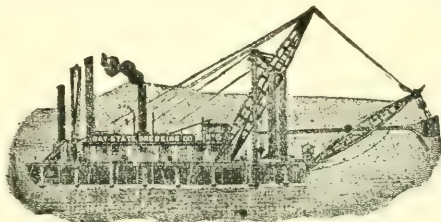
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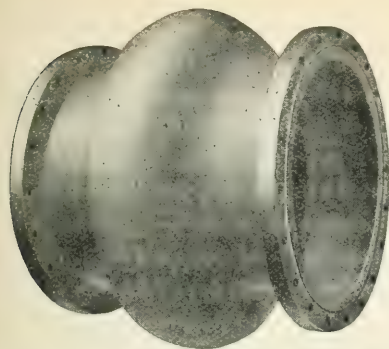
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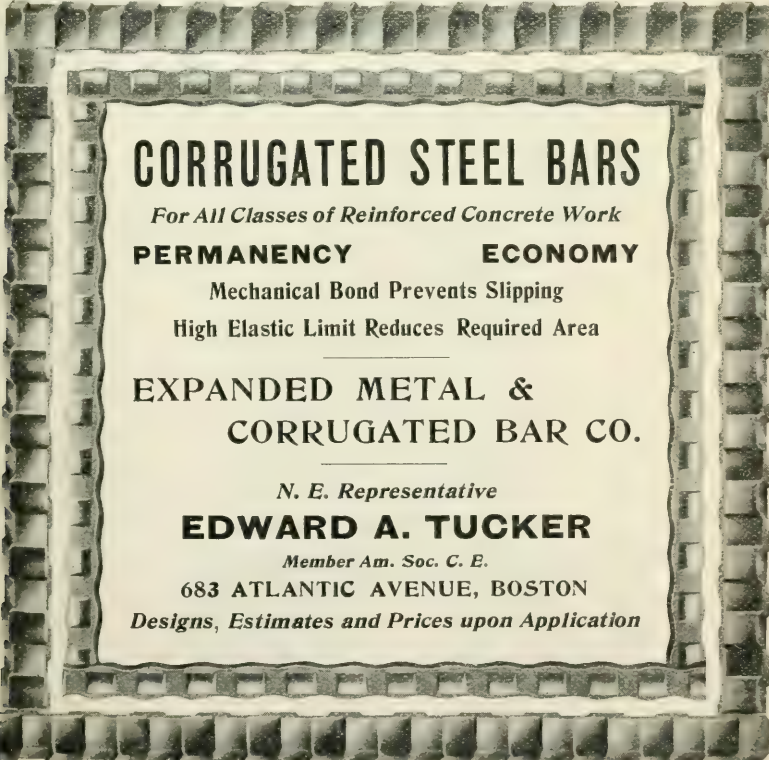
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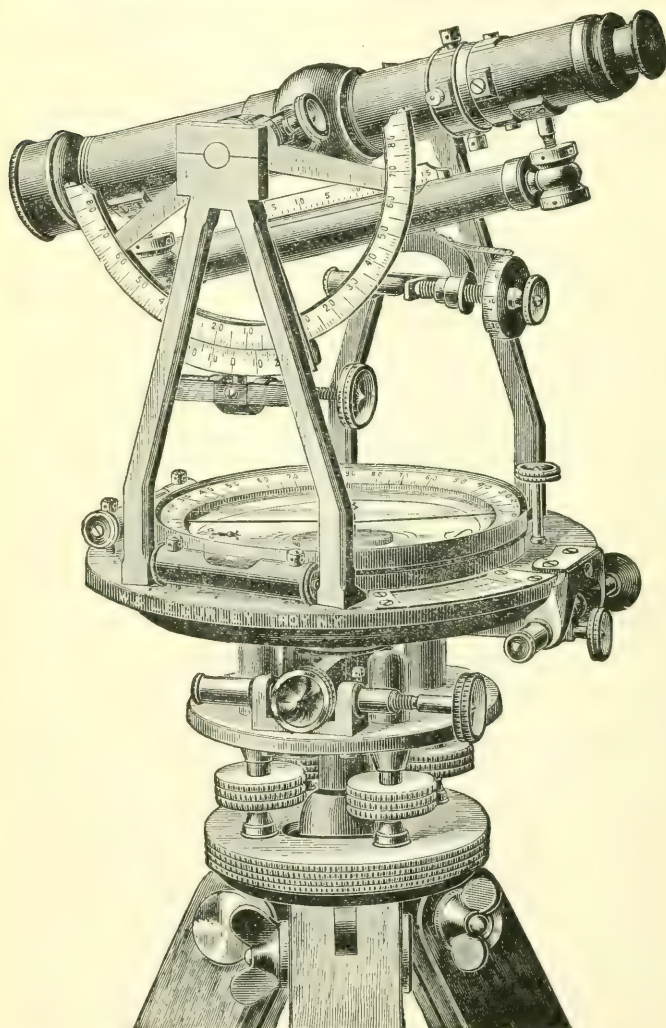
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**ORGANIZED JULY 3, 1848.**

## **MONTHLY BULLETIN.**

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NEW SERIES.

SEPTEMBER, 1906.

No. 4.

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### **REGULAR MEETING.**

A regular meeting of the Boston Society of Civil Engineers will be held on Wednesday, September 19, 1906, at 7.30 o'clock P. M., in

CHIPMAN HALL, TREMONT TEMPLE, BOSTON.

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The meeting will be devoted to a discussion on reinforced concrete construction.

Mr. Chester J. Hogue will open the discussion with a brief description of reinforced concrete factory construction as a type, introducing questions of design of common interest.

The following topics are suggested for the consideration of members, and they are invited to take part in the discussion.

**FOOTINGS.** Tension and compression stresses,  
Thickness required for shear.

**COLUMNS.** Three methods of increasing strength :  
Richness of mixture,  
Longitudinal compression rods,  
Hooping.

**BEAM CONSTRUCTION.** Spacing and detailing of tension rods,  
Compression stresses in a T-beam,  
Provisions for resisting shear.

The following members have promised to be present and to take part in the discussion :

Wm. M. Bailey, J. E. Cheney, L. J. Johnson, F. P. McKibben,  
G. F. Swain, S. E. Thompson, L. C. Wason and J. R. Worcester,



Mr. H. B. Andrews, Engineer, Simpson Bros. Corporation, has kindly consented to be present and join in the discussion.

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**BUSINESS OF THE MEETING:** To ballot on the applications for membership as announced in this notice.

To receive report of committee on Memoir of E. Elbert Young.

S. E. TINKHAM, *Secretary*.

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## EXCURSION.

There will be an excursion on Wednesday, September 19, to the Sewage Pumping Station at DEER ISLAND. The use of the city steamer "Monitor" has been secured, and members will meet at Eastern Ave. Wharf, Atlantic Ave., on north side of the South Ferry, at 2 o'clock promptly. Steamer sails at 2.15. The party will disembark at Deer Island where an inspection of the centrifugal sewage pumps will be made. If time remains after the steamer returns from its regular stops, a short sail toward Boston Light is promised. As many members were unable to attend the previous excursion to the Deer Island plant, a fresh opportunity is thus given to do so, and it is hoped the attendance will be large.

## EXCURSION BUTTONS.

The Excursion Committee has secured special excursion buttons, which will be distributed to members joining in the excursion or may be obtained at the Society Rooms. It is earnestly requested that members will wear these buttons on the lapel of their coats on all excursions to facilitate the work of the Committee and help to cement the social ties of the Society by assuring recognition of members on our excursions.

## EXCURSION COMMITTEE.

---

## CANDIDATES FOR MEMBERSHIP.

To be balloted on at meeting September 19, 1906.

RICHARD GARDNER HARTSHORNE, Brookline, Mass., (b. 1881). Educated at Wakefield High School and at Mass. Institute of Technology.

Summers of 1901 and 1902 with L. E. Hawes, C. E.; summers of 1903 and of 1904 with Mass. Electric Co., Boston; from Oct., 1904 to June, 1905, assistant in Civil Engineering Department, Mass. Inst. of Technology; from June, 1905, to March, 1906, resident engineer, Penn. Steel Co.; and from March, 1906, to present time resident engineer, New England Structural Co. on N. Y., N. H. & H. R. R. locomotive shops at Readville. Recommended by C. F. Allen, C. B. Breed, L. E. Hawes and F. H. Fay.

EDWARD AUSTIN TUCKER, Winchester, Mass., (b. 1872). Graduate in civil engineering, Mass. Institute of Technology, 1895. With Boston Bridge Works, 1895-6; with Ernest Flagg, New York, 1896-7; with Norcross Bros., 1897-8; and from 1899 to date in private practice as an architectural engineer. Also since 1904 representative of the corrugated bar system of the Expanded Metal and Corrugated Bar Co., St. Louis. Recommended by W. S. Johnson, F. P. McKibben, Leonard Metcalf and W. H. Norris.

---

## MINUTES OF THE JUNE MEETING.

A regular meeting of the Boston Society of Civil Engineers was held at Chipman Hall, Tremont Temple, at 8 o'clock P. M., President Frank W. Hodgdon in the chair; twenty-eight members and visitors present.

The record of the last meeting was read and approved.

Messrs. William T. Blunt, Bertram W. Ransom and John W. Storrs were elected members of the Society.

The Secretary read a memoir of William T. Pierce, a member of the Society, which had been prepared by Ernest W. Bowditch and Daniel W. Pratt, a committee of the Society.

The Secretary announced the death of the following members of the Society: John J. Howard, died May 18, 1906; Isaac K. Harris, died May 21, 1906; and E. Elbert Young, died June 1, 1906. On motion, the President was requested to appoint committees to prepare memoirs of the deceased members.

The President has appointed the following committees: On memoir of John J. Howard, Mr. H. V. Macksey; on memoir of Isaac K. Harris, Mr. Otis F. Clapp and E. F. Dwelley; and on memoir of E. Elbert Young, Mr. H. A. Carson.

Prof. F. B. Sanborn read the paper of the evening, entitled, "Fires and Their Prevention in Factories." The paper was fully illustrated by lantern slides.

Mr. S. G. Walker, insurance engineer for Manufacturers' Mutual Fire Insurance Company of Providence, gave a very interesting account of the work of that company.

## APPLICATIONS FOR MEMBERSHIP.

The following applications for membership have been received, and are now before the Board of Government for approval. Members having information which will assist the government in its consideration of these applications are requested to communicate at once with any member of the Board. Communications will be regarded as confidential and for the use of the Board alone.

JOHN RICHARD RABLIN, Boston, (b. 1868). Prepared for college at Boston Latin School, graduated 1888. Entered Harvard College but did not attend. Employed in engineering department, N. Y., N. H. & H. R. R. 1888-1895, private study and instruction in engineering during this time; employed in Street Department, City of Boston 1875-6; employed as inspector and asst. engr. on construction, South Terminal and Back Bay Stations, Boston, 1897-8; employed by Metropolitan Park Commission as asst. engr. 1899-1904; appointed chief engineer, Metropolitan Park Commission in September, 1904, holding same position to present time. Recommended by F. W. Hodgdon, C. B. Pratt, B. A. Rich and C. F. Morse.

JOHN STEWART RANKIN, Fall River, Mass., (b. 1885). Graduated from Somerville, Mass., Grammar School, and finished 2 1-2 years at Somerville English High School in Technology division, followed by private study. Employed from May, 1902, to date by Hollis French and Allen Hubbard, consulting engineers, Boston. From May, 1902, to May, 1903, as draftsman in office; from May, 1903, to Feb., 1905, on construction of the 6000 H. P. hydro-electric development at Garvin's Falls, N. H., as rodman and instrument man; from Feb., 1905, to Mar., 1906, instrument man and asst. engineer on plans and construction of Sewall's Falls, N. H., Canal and Power Station (1800 H. P.); Mar., 1906, to date in similar position on construction of Fall River Electric Light Co.'s steam turbine steam station (6000 H. P.). While at Garvin's Falls worked on preliminary survey and plans of another hydro-electric development of 4000 H. P. Recommended by G. G. Shedd, J. W. Rollins, Jr., H. K. Barrows and W. B. Howe.

EDWARD B. RICHARDSON, Brookline, (b. 1875). Graduated from Mass. Institute of Technology in course of electrical engineering in 1898. With Lord Electric Co. on South Station and with the General Electric Co. during fall and winter of 1898-99; and since then with French & Hubbard, consulting engineers. Had charge of power station design for Garvin's Falls plant and also Sewall's Falls plant near Concord, N. H. Now working on steam plant design for Fall River Electric Light Co. in above office, as chief engineer on power station design and certain other parts of work. Recommended by G. G. Shedd, J. W. Rollins, Jr., J. R. Worcester and G. E. Evans.

### AS AN ASSOCIATE.

CLAUDE ALBERT PALMER, Boston, (b. 1877). Graduated from Syracuse High School in 1895, and completed business course at Wells Commercial College at Syracuse, N. Y., in 1896. Bookkeeper for Syracuse

Stoneware Co., Syracuse, N. Y., 1896-8; resident manager, New York Pottery Co., New York, 1899-1904; asst. manager, The Robinson Clay Product Co., New York, 1904-5; manager, Philadelphia Branch of same copy, 1905-6; and May 23, 1906, appointed General Manager Eastern Clay Goods Co., Boston. Recommended by C. S. Robbins, B. R. Felton, L. A. Taylor and L. N. Farnum.

## LIBRARY NOTES.

### RECENT ADDITIONS TO THE LIBRARY.

- Bangor, Me., Report of Water Board, 1905-06.  
 Brockton, Mass., Annual Report of City Engineer and Sewerage Commissioners, 1905.  
 Lawrence, Mass., Annual Report of Water Board, 1905.  
 New Orleans, La., Semi-Annual Report Sewerage and Water Board, 1906.  
 Northampton, Mass., Annual Reports for 1905.  
 Providence, R. I., Quarterly Report Board of Public Works, June, 1906.  
 Reading, Pa., Annual Report of Water Commissioners, 1905.  
 St. Louis, Mo., Annual Report of Water Commissioners, 1905.  
 Wilmington, Del., Report of Board of Water Commissioners, 1905.  
 Connecticut, Report of Railroad Commissioners, 1905.  
 Maryland, Fourth Report on Highways of 1904-05; First Report on State Highway Construction, 1905-06.  
 U. S. Dept. of Agriculture, Field Operations, Bureau of Soils, Text and Maps, 1904.  
 U. S. Dept. of Interior, Report of Commissioner of Education for 1904, vol. 1.  
 U. S. Dept. of Agriculture, Report of Chief of Weather Bureau, 1904-05.

### LIST OF MEMBERS.

#### ADDITION—SANITARY SECTION.

HORACE H. CHASE, with Snow & Barbour, 29 Appleton St., Brockton, Mass.

F. S. BADGER	.	.	.	.	.	Apartado 291, Monterey, Mexico.
T. H. BARNES	.	.	.	.	.	Bocas del Toro, Rep. Panama, via Mobile.
F. G. BERRY	.	.	.	.	.	71 Moulton St., Lynn, Mass.
W. S. COULTER	.	.	.	.	.	64 North Allen St., Albany, N. Y.



F. R. DAVIS	.	.	.	.	.	Waverly House, Herkimer, N. Y.
J. P. DAVIS	.	.	.	.	.	332 Palisade Ave., Yonkers, N. Y.
DAVID HINCKLEY	.	.	.	.	.	46 Cedar St., New York, N. Y.
THEO. HORTON	.	.	.	.	.	State Dept. of Health, Albany, N. Y.
E. E. PETTEE	.	.	.	.	.	107 Exchange Bldg., Boston.
LEMUEL POPE	.	.	.	.	.	118 State St., Portsmouth, N. H.
JAMES RICE	.	.	.	.	.	Du Pont Powder Works, Wilmington, Del.
T. F. RICHARDSON	.	.	.	.	.	Chief Engineer Rockingham Power Development Co., Hamlet, N. C.
E. D. SABINE	.	.	.	.	.	23 East 48th St., New York, N. Y.
G. EDWARD SLEEPER	.	.	.	.	.	102 North 7th St., Newark, N. J.
H. R. STANFORD,	Westinghouse Electric and Manfg. Co.,	Pittsburg, Pa.				
S. H. THORNDIKE	.	.	.	.	.	60 City Hall, Boston.
F. L. TOOF	.	.	.	.	.	108 Pocasset Ave., Providence, R. I.
J. W. WALKER	.	.	.	.	.	Brooksville, Me.

## NEW ENGINEERING WORK.

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(Under this head the Excursion Committee proposes to present each month a brief resume of engineering work in progress in New England, as far as such information is readily obtainable. The assistance of members is desired, and items of interest will be gladly received. Such items are intended to include not only works of exceptional magnitude or containing novel features, but also engineering construction work of all kinds and all degrees of magnitude. Notes should be in the hands of the Committee not later than the 2nd Wednesday of each month. The thanks of the Committee are due to the members who have furnished data for the Bulletin.—E. M. BLAKE, Secretary, Excursion Committee, 8 Beacon St., Boston.)

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**Commonwealth of Massachusetts.**—**HARBOR AND LAND COMMISSION.**—Extension of stone breakwater at Witchmere Harbor, Harwichport, constructed of granite quarry grout, about 300 feet long.

Extension of granite breakwater about 150 feet at Apponagansett Harbor, South Dartmouth. Each of the above contracts calls for the expenditure of about \$10,000.

Work of enlarging and strengthening the jetties at Menemsha Inlet at the western end of Martha's Vineyard and the dredging of the channel and anchorage basin has been let. The work will be commenced shortly, and will cost \$25,000.

The dredging of Annisquam River, making a channel 50 feet wide and 6 feet deep at mean low tide, is still in progress; cost, \$50,000.

The breakwater at Vineyard Haven has been completed during the past month at a cost of about \$10,000.

**METROPOLITAN PARK COMMISSION.**—*Charles River Reservation.*—Building to sub-grade roadway through United States Arsenal Grounds, Arsenal St., to North Beacon St., and building masonry river wall.

*Furnace Brook Parkway.*—Surfacing and finishing Furnace Brook Parkway from Adams St. to Blue Hills Reservation.

*Mystic River Reservation.*—Building to sub-grade roads along the Mystic River from High St., Medford and Arlington, to Cradock Bridge, Main St., Medford.

Reinforced concrete masonry bridge over Mystic River, near Armory, Medford.

Reinforced concrete masonry bridge over Mystic River at Auburn St., Medford.

*Quincy Shore Reservation.*—Building to sub-grade Quincy Shore Reservation from Atlantic St. to National Sailors' Home.

*Revere Beach Parkway.*—Treating surface of macadam roads from Main St., Everett, to Revere Beach Reservation, Revere, with Tarvia.

**HIGHWAY COMMISSION.**—The State highway work is now being done in the following cities and towns :

Agawam,	E. Longmeadow,	Melrose,	Saugus,
Becket,	Gloucester,	Middleboro,	Scituate,
Bellingham,	Granby,	Millbury,	Sunderland,
Berkley,	Gt. Barrington,	Montague,	Swansea,
Canton,	Greenfield,	Needham,	Truro,
Charlton,	Haverhill,(Bridge)	Northampton,	Wareham,
Concord,	Hatfield,	No. Brookfield,	West Newbury,
Dighton,	Hudson,	Rockland,	Whately.

**City of Boston.**—**ENGINEERING DEPARTMENT.**—*Northern Avenue Bridge.*—The concrete foundation for the centre bearing pier for the draw and the masonry of the channel pier on the Boston side are completed. The foundation for the Boston abutment is in place and the masonry of the abutment is partly laid; concrete for the foundation of the South Boston pier is half in place and the piles of the South Boston channel pier are driven. The timber draw pier, nearly 600 feet long and 88 feet wide, is finished with the exception of a small amount of planking.

*Atlantic Avenue Bridge,* over the Yard of the Boston Terminal Company and Fort Point Channel.—The superstructure of the fixed spans is completed with the exception of the sidewalk surfacing, iron railings and roadway gates. The railings and gates are being erected. Paving of the Boston Approach is in progress. About 225 tons of steel for the draw span have been received and the erection of the draw span will shortly be begun.

*Cambridge Bridge over Charles River, Boston to Cambridge.*—Both surface tracks are now in use for street car travel, and by the removal of street cars from the temporary bridge the city of Boston is enabled to complete its work upon the Boston Approach. The four ornamental towers on the central piers are now being built. The painting of the steel superstructure is underway. Work upon the completion of both abutments is in progress.

**Boston Transit Commission.**—Work is progressing on the Washington-St. Tunnel from about 100 feet north of State St. to near the Relief Station in Haymarket Square.

**Charles River Basin Commission.**—Practically all the concrete is in place at the lock except at the section including the upper gate recess and at section at the lower end under the bridge. At both these points concrete is now going in. The steel for one-half of the drawbridge sub-structure has arrived and is now being put in place. This drawbridge is to be of the Scherzer rolling lift type.

Section 1 of the Boston Marginal Conduit, included in the contract for the dam and locks, is more than half completed.

Plans and specifications for section 3 of the Boston Marginal Conduit and for section 1 of the Boston Embankment, which extends from Cambridge bridge to a point between Berkeley and Clarendon Streets, have been completed and bids advertised for, to be opened Monday, September 10.

At the sluices concrete is now being put in at the easterly half and the arches are turned for the larger part of one side.

It may be of interest to the members of the Society to know that section 2 of the Boston Marginal Conduit, completed some months ago by James Driscoll & Son, has shown itself to be an unusually fine piece of concrete work. When it was finished the ends were closed by brick bulkheads. It is so tight that even after several months there is only a very slight amount of water in it. The concrete was made in the proportion of one, two and a half, four and a half.

**Boston Elevated Railway.**—ELEVATED CONSTRUCTION.—The steel structure for the Forest Hills Extension has reached School Street, near Egleston Square, and will probably be erected as far as Cornwall Street by the first of October. At Sullivan Square the steel structure for the new storage yard is erected and work has begun on the reinforced concrete floor for the yard.

**New York, New Haven & Hartford R. R.**—Abolition of the grade crossing at Dudley Street consists in elevating two tracks of the Midland Division to a maximum of ten feet and carrying Dudley Street under. It includes new bridges at Massachusetts Avenue, Cottage Street and Norfolk Avenue and the extension of the brick arch at Clapp Street. Abutments are to be of concrete masonry and retaining walls of third-class granite. Work on the West Roxbury Branch is very nearly finished and the last arch at Granville Avenue is nearing completion.



**Boston & Albany Railroad.**—**ABOLITION OF GRADE CROSSINGS.**—*Newton Centre.*—Beaconsfield Street on Newton Circuit.—Foundations are in and plans of building are ready and bids are soon to be called for.

*Reservoir Lane.*—Abutments for the overhead highway bridge are completed and work is about to begin on the bridge itself. Approaches to the bridge on either side, comprising a total of about 2,000 feet of new road have been let to Malone and Son.

*Glen Avenue.*—Abutments to bridge are completed.

*Newton Centre.*—Abutment walls are nearly completed and excavation between the walls was started the first of September. C. G. Gow & Co. are the contractors. The excavation for new roadway is to be made in 3 ft. cuts, and piles will be driven to carry the temporary trestles.

*Newton Highlands.*—Floors are being laid on the two new bridges at Hyde Street and Rogers Street.

*Kneeland Street.*—The reinforced concrete warehouse is under construction. The first story columns are being built and the basement and first floor have been completed.

*East Boston.*—The old piles on the Clyde Street pier are nearly removed and work on the new pier will begin in October.

*Pittsfield and North Adams Branch.*—The abutments and piers have been completed and grading is under way on the abolition of grade crossing at Maple Grove.

**Haverhill, Mass.**—The highway bridge across the Merrimack river at Haverhill bridge will consist of five pin-connected truss spans of 153' 5" each and one plate girder span of 61'. The substructure of this bridge is now being constructed. The north abutment is complete and also pier No. 1 on the northerly bank, and pier. No. 5. Pier No. 4 is nearly completed. The foundations for the south abutment are nearly in and the work is now being done on the foundations for pier No. 3, where concrete is being laid under water inside a crib. The contractors for this work are The Miller-Collins Company of New York; the resident engineer is Mr. R. R. Evans, city engineer of Haverhill, and the consulting engineer, Professor George F. Swain of Boston. The American Bridge Company are the contractors for the superstructure.

**Gloucester, Mass.**—The highway bridge at Gloucester is to be a double-leaf rolling lift bridge, with an opening of forty feet across a tidal inlet at Western Ave. The abutments are to be of concrete. The easterly one has been completed, and work is now going on at the westerly one. The tide flows quite swiftly through the opening. The contractors for this work are Holbrook, Cabot and Rollins Corporation, the resident engineer is Mr. H. W. Spooner, engineer of the Gloucester Water Works, and the consulting engineer, Professor George F. Swain.

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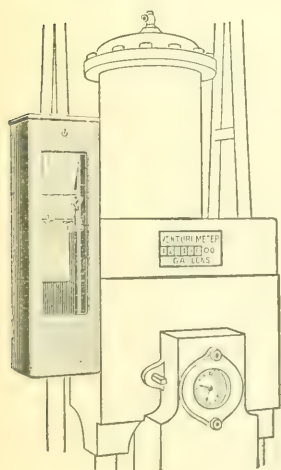
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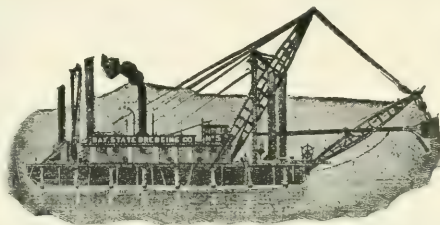
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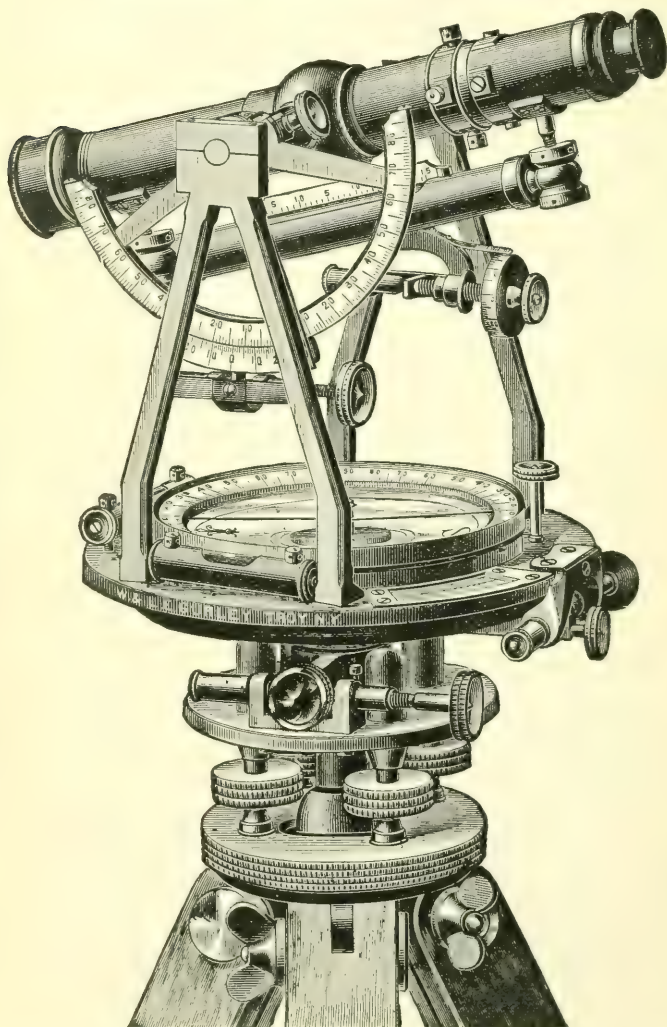
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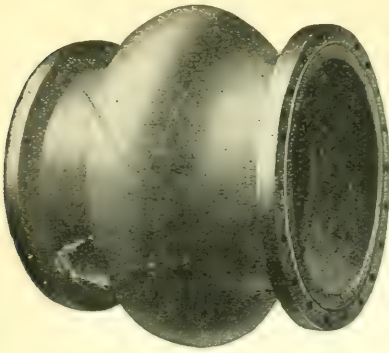
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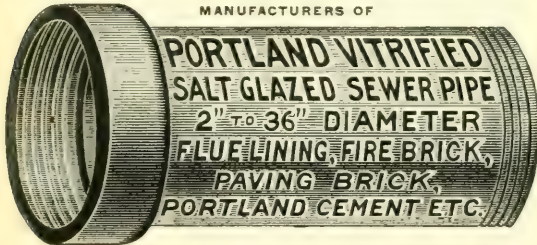
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## MONTHLY BULLETIN.

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NEW SERIES.

OCTOBER, 1906.

No. 5.

---

### REGULAR MEETING.

A regular meeting of the Boston Society of Civil Engineers will be held on Wednesday, October 17, 1906, at 7.30 o'clock P. M., in

CHIPMAN HALL, TREMONT TEMPLE, BOSTON.

---

Mr. Charles Moore, Chairman of the Board of Directors of The Submarine Signal Company, will give an informal talk on "The Submarine Signal," illustrated by lantern slides.

BUSINESS OF THE MEETING: To ballot on the applications for membership as announced in this notice.

S. E. TINKHAM, *Secretary.*

---

### EXCURSION.

Through the courtesy of the Submarine Signal Company, members of the Society will have the privilege of inspecting the operation of the Submarine Signal system in Boston Harbor on Wednesday, October 17. The trip will be made on the company's steamer "Aurora," which is thoroughly equipped with apparatus for experimental work in submarine signalling. Members will meet promptly at 10 o'clock A. M., weather permitting, at the outer end of India Wharf, 288 Atlantic Ave. The steamer is expected to reach the wharf on return about 5 o'clock P. M.



If weather conditions are unfavorable, announcement will be made by card of the postponed date. As it is desired by the Committee to know very closely the number who will attend, it is necessary that the Secretary, Mr. E. M. Blake, 8 Beacon St., Boston, Mass., be notified not later than Monday afternoon, October 15.

## EXCURSION BUTTONS.

The Excursion Committee has secured special excursion buttons, which will be distributed to members joining in the excursion or may be obtained at the Society Rooms. It is earnestly requested that members will wear these buttons on the lapel of their coats on all excursions to facilitate the work of the Committee and help to cement the social ties of the Society by assuring recognition of members on our excursions.

## EXCURSION COMMITTEE.

---

## CANDIDATES FOR MEMBERSHIP.

To be balloted on at meeting October 17, 1906.

### AS MEMBERS.

JOHN RICHARD RABLIN, Boston, (b. 1868). Prepared for college at Boston Latin School, graduated 1888. Entered Harvard College but did not attend. Employed in engineering department, N. Y., N. H. & H. R. R. 1888-1895, private study and instruction in engineering during this time; employed in Street Department, City of Boston 1875-6; employed as inspector and asst. engr. on construction, South Terminal and Back Bay Stations, Boston, 1897-8; employed by Metropolitan Park Commission as asst. engr. 1899-1904; appointed chief engineer, Metropolitan Park Commission in September, 1904, holding same position to present time. Recommended by F. W. Hodgdon, C. B. Pratt, B. A. Rich and C. F. Morse.

JOHN STEWART RANKIN, Fall River, Mass., (b. 1885). Graduated from Somerville, Mass., Grammar School, and finished 2 1-2 years at Somerville English High School in Technology division, followed by private study. Employed from May, 1902, to date by Hollis French and Allen Hubbard, consulting engineers, Boston. From May, 1902, to May, 1903, as draftsman in office; from May, 1903, to Feb., 1905, on construction of the 6000 H. P. hydro-electric development at Garvin's Falls, N. H., as rodman and instrument man; from Feb., 1905, to Mar., 1906, instrument man and asst. engineer on plans and construction of Sewall's Falls, N. H., Canal and Power Station (1800 H. P.); Mar., 1906, to date in similar position on construction of Fall River Electric Light Co.'s steam turbine steam station (6000 H. P.). While at Garvin's Falls worked on preliminary survey and plans of another hydro-electric development of 4000 H. P. Recommended by G. G. Shedd, J. W. Rollins, Jr., H. K. Barrows and W. B. Howe.

EDWARD B. RICHARDSON, Brookline, (b. 1875). Graduated from Mass. Institute of Technology in course of electrical engineering in 1898. With Lord Electric Co. on South Station and with the General Electric Co. during fall and winter of 1898-99; and since then with French & Hubbard, consulting engineers. Had charge of power station design for Garvin's Falls plant and also Sewall's Falls plant near Concord, N. H. Now working on steam plant design for Fall River Electric Light Co. in above office, as chief engineer on power station design and certain other parts of work. Recommended by G. G. Shedd, J. W. Rollins, Jr., J. R. Worcester and G. E. Evans.

AS AN ASSOCIATE.

CLAUDE ALBERT PALMER, Boston, (b. 1877). Graduated from Syracuse High School in 1895, and completed business course at Wells Commercial College at Syracuse, N. Y., in 1896. Bookkeeper for Syracuse Stoneware Co., Syracuse, N. Y., 1896-8; resident manager, New York Pottery Co., New York, 1899-1904; asst. manager, The Robinson Clay Product Co., New York, 1904-5; manager, Philadelphia Branch of same company, 1905-6; and May 23, 1906, appointed General Manager Eastern Clay Goods Co., Boston. Recommended by C. S. Robbins, B. R. Felton, L. A. Taylor and L. N. Farnum.

## MINUTES OF MEETINGS.

### SEPTEMBER MEETING OF SOCIETY.

A regular meeting of the Society was held at Chipman Hall, Tremont Temple, on Wednesday, September 19, 1906, at 7.55 o'clock P.M. President Frank W. Hodgdon in the chair; 106 members and visitors present.

The record of the last meeting was read and approved.

Messrs. Richard Gardner Hartshorne and Edward Austin Tucker were elected members of the Society.

The Secretary read a memoir of Eddy Elbert Young, a member of the Society, which had been prepared by Mr. Howard A. Carson, a committee of the Society.

On motion of Mr. Winslow, the thanks of the Society were voted to the Hon. John B. Martin, Penal Institutions Commissioner of Boston, for the use of the city steamer "Monitor" on the occasion of the trip to Deer Island this afternoon.

On motion of Mr. Kimball, the thanks of the Society were voted to Mr. E. B. Winslow, President of the Portland Stoneware Co. and to other officials of that company for the courtesies and generous entertainment extended to members of the Society, on the occasion of the trip to Portland, Me., August 3 to 5, 1906.

The discussion of the evening was on Reinforced Concrete Construction, and was opened by Mr. Chester J. Hogue with a brief description of reinforced concrete factory construction as a type. He was followed by Messrs. L. C. Wason, J. R. Worcester and L. J. Johnson.

On account of the lateness of the hour, it was voted, on motion of Mr. L. F. Rice, to continue the discussion at a future meeting, to be held at an early date, as determined by the Board of Government.

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### SPECIAL MEETING, OCTOBER 5, 1906.

A special meeting of the Society was held in the library, Tremont Temple, Boston, on Friday, October 5, 1906, at 8 o'clock P. M.; 62 members and visitors present.

In the absence of the President and Vice-Presidents, Mr. J. R. Worcester was elected Chairman.

The meeting was devoted to a continuation of the discussion on Reinforced Concrete Construction begun at the last regular meeting. Messrs. S. E. Thompson, William Parker, L. J. Johnson, L. C. Wason, C. J. Hogue, E. S. Larned and others took part in the discussion.

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### APPLICATIONS FOR MEMBERSHIP.

The following applications for membership have been received, and are now before the Board of Government for approval. Members having information which will assist the government in its consideration of these applications are requested to communicate at once with any member of the Board. Communications will be regarded as confidential and for the use of the Board alone.

RAYMOND CLEVELAND ALLEN, Manchester, Mass., (b. 1877). Educated at the common schools of Manchester and the High School of Gloucester. Graduated from Brown University in 1897, with degree of B. S., having specialized in civil engineering studies. Opened a general engineering and surveying office in Manchester, Sept., 1897. Since then has carried on work of said office, and performed most of the engineering work of the Town of Manchester. Has superintended considerable construction work, designed and superintended roads, piers, &c. At present, as above, in general practice at Manchester, Mass. Recommended by F. C. Coffin, F. B. Rowell, A. D. Fuller and Stephen Child.

GEORGE EDWARD HARKNESS, Boston, (b. 1872). Graduated from Mass. Inst. of Technology in 1876, civil engineering course. Summer of 1895 with City of Medford, as inspector on sewer construction, Oct., 1890,

to June, 1897, with Boston Transit Commission, on subway, as inspector; July, 1897, to June, 1900, transitman on Charlestown Bridge; July, 1900, to March, 1901, transitman, and April, 1901, to date, assistant engineer on Cambridge Bridge. Recommended by M. G. Woodward, William Jackson, F. H. Fay and S. H. Thorndike.

## LIST OF MEMBERS.

### ADDITIONS.

RICHARD G. HARTSHORNE . . . . . 110 State St., Boston.

### CHANGES OF ADDRESS.

WM. L. BLOSSOM . . . . . 122 Davis Ave., Brookline, Mass.  
 FRANK H. CARTER . . . . . 147 Magazine St., Cambridgeport, Mass.  
 H. J. GLENDENNING . . . . . Milford, Mass.  
 DAVID HINCKLEY . . . . . 428 Walnut St., Philadelphia, Pa.  
 E. E. PETTEE . . . . . 79 Milk St., Boston.  
 C. S. SHAUGHNESSY . . . . . Peekskill, N. Y.  
 FRANK W. UPHAM . . . . . Altadena, Calif.  
 J. R. WORCESTER . . . . . 79 Milk St., Boston.

### DEATH.

JOHN E. CHENEY . . . . . Died Sept. 25, 1906.  
 NELSON SPOFFORD . . . . . Died Oct. 3, 1906.

## LIBRARY NOTES.

### RECENT ADDITIONS TO THE LIBRARY.

Canadian Society of Civil Engineers, Transactions, Jan. to June, 1905.

Ohio Engineering Society, Report of 27th Annual Meeting, 1906.

Minneapolis, Minn., Annual Report, Registrar and Supervisor of Water Works, 1905.

St. Louis, Mo., Annual Report of Water Commissioner for year 1904-5.

Toronto, Canada, Annual Report of City Engineer for 1905.

U. S. Library of Congress, Classification, Class Q, Science, 1905.



## NEW ENGINEERING WORK.

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(Under this head the Excursion Committee proposes to present each month a brief resume of engineering work in progress in New England, as far as such information is readily obtainable. The assistance of members is desired, and items of interest will be gladly received. Such items are intended to include not only works of exceptional magnitude or containing novel features, but also engineering construction work of all kinds and all degrees of magnitude. Notes should be in the hands of the Committee not later than the 2nd Wednesday of each month. The thanks of the Committee are due to the members who have furnished data for the Bulletin.— E. M. BLAKE, Secretary, Excursion Committee, 8 Beacon St., Boston.)

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**United States Government.**— **BUILDINGS ERECTED FOR THE CONTROL OF GUN FIRE.**— About \$150,000 has been expended during the current year in the erection of fire-controlling buildings at the harbor fortifications. These buildings are nearly all one story in height and are a development of the old balloon frame type. For protection against fire and fragments of shells the walls are constructed as follows:— Back boarding is toe-nailed in between the joists which are spaced 14 inches centre to centre, and  $\frac{1}{4}$  inch rounds are attached to the faces of these joists by staples. Against these rounds metal lathing is stretched, and then the Portland cement mortar, mixed 1 : 3, is applied to a thickness of about  $1\frac{1}{2}$  inches. This treatment applies to the outer walls. For the inner walls the metal lathing is attached directly to the joists and is then backed up with building paper. The mortar is applied to the thickness of ordinary plastering. A practical test was made on an experimental building after being constructed for three weeks. Severe blasts from the heavy guns would force out window frames and door panels when closed and destroy lime mortar construction, but these heavy concussions had no injurious effect on the reinforced mortar construction as described above.

**LEDGE SOUNDINGS.**— An accurate and detailed hydrographic survey is being made of the ledges on the south side of the upper main ship channel inside of Castle Island. These ledges were uncovered in dredging for the 35-foot ship channel, and the face of the ledge is from 25 to 35 feet below mean low water. This survey is being made for purposes of estimate in making of contracts and contract payments for removal. For this ledge removal about \$700,000 has been set aside out of the general appropriation for the 35-foot ship channel, and of this amount about \$250,000 is now under contract. The remainder will probably be let during

the coming winter. It costs the Government under present contract about \$16 per cubic yard, place measurement, to take out this ledge, the measurements being based on the above surveys.

**Commonwealth of Massachusetts.**—METROPOLITAN PARK COMMISSION.—*Charles River Reservation.*—Building to sub-grade roadway through United States Arsenal Grounds, Arsenal St., to North Beacon St., and building masonry river wall.

*Furnace Brook Parkway.*—Surfacing and finishing Furnace Brook Parkway from Adams St. to Blue Hills Reservation.

*Lynn Fells Parkway.*—Concrete abutments for Boston & Maine Railroad Bridge over Parkway.

*Mystic River Reservation.*—Building to sub-grade roads along the Mystic River from High St., Medford and Arlington, to Cradock Bridge, Main St., Medford.

Reinforced concrete masonry bridge over Mystic River, near Armory, Medford.

Reinforced concrete masonry bridge over Mystic River at Auburn St., Medford.

*Quincy Shore Reservation.*—Building to sub-grade Quincy Shore Reservation from Atlantic St. to National Sailors' Home.

**HIGHWAY COMMISSION.**—The State highway work is now being done in the following cities and towns :

Aga van,	Granby,	Middleboro,	Saugus,
Becket,	Gt. Barrington,	Millbury,	Scituate,
(Road and Bridge).	Greenfield,	Needham,	Spencer,
Bedford,	Hatfield,	Haverhill,	Sunderland,
Bellingham,	(Road and Bridge).	(Steel Concrete Bridge).	Swansea,
Berkley,	Holliston,	No. Brookfield,	Tewksbury,
Burlington,	Hudson,	Norton,	Truro,
Canton,	Huntington,	Oxford,	Wareham,
Charlton,	(Road and Bridge).	Pittsfield,	Whately.
Dighton,	Mansfield,	Rehoboth,	
Eastham,	(Road and Bridge).	Richmond,	
Falmouth,	Melrose,	Rockland,	

**HARBOR AND LAND COMMISSION.**—Extension of stone break-water at Apponagansett harbor is still in progress.

Work will shortly be commenced under contract for strengthening jetties at Menamsha Inlet, and dredging the channel and anchorage basin there.

Extension of the stone jetty at Witchmere harbor, Harwich-port, is still in progress.

It is expected that the work of dredging the Ipswich River,

and a channel and yacht basin at Cottage Park, Winthrop, will be commenced during the month.

**CHARLES RIVER BASIN COMMISSION.**—At the locks and sluices concrete is still being put in and the sluice gate bolts are being set. These gates, eight in number, are to be  $7\frac{1}{2}$  feet by 10 feet in size, and arranged to be electrically operated by 500 volt, direct current motors. They are to be furnished by the Coffin Valve Company.

The contract for section 3 of the Boston Marginal Conduit, and section 1 of the Boston Embankment, has recently been awarded to Coleman Brothers, for \$232,700.00, and they have just commenced work at the Cambridge bridge end.

Plans and specifications are now being prepared for section 4 of the Boston Marginal Conduit, and section 2 of the Boston Embankment, extending to a point between Fairfield and Gloucester Streets.

Bids will be opened, Monday, Oct. 15th, for steam piping to be put inside of the lock gates to keep ice from forming on them, as they must be capable of being operated at all seasons of the year. This system of piping is the result of experiments made last winter at Mystic Lake, and described in an interesting article in the "Engineering News," March 8, 1906.

Plans and specifications are also being prepared for the boiler plant for supplying steam for all heating purposes at the locks and sluices and lock gate houses.

**City of Boston.**—**ENGINEERING DEPARTMENT.**—*Brookline St. Bridge over the B. & A. R. R. and Charles River, Cottage Farm.*—The erection of the steel spans over the railroad and waterways is completed. The wooden floor of the steel spans and of the remaining portions of the pile bridge is being laid.

**SEWER DEPARTMENT.**—*Stony Brook Conduit, Washington St. at Green St. and at Williams St.*—Twenty feet and 16 feet reinforced concrete conduit; quicksand excavation.

*Florence St. Brook, from Florence and Sycamore Sts. to Poplar St., near Hawthorne St.*—Sizes ranging from 3'-6" to 5'-9" reinforced concrete conduits.

(The above two jobs are in West Roxbury District.)

*Mount Washington Ave. Outlet, South Boston.*—Sizes ranging from 12-inch pipe sewer to 6-foot diameter brick surface drain.

*Brook Ave., off Dudley St., Roxbury.*—Eighteen-inch pipe sewer to 8-feet circular brick conduit—both carried in same trench.

**STREET DEPARTMENT.**—*Columbus Ave.* from the bridge over the Boston and Albany Railroad to about 60 feet north of Station St.—The work is divided into two sections. The first section will be resurfaced with  $1\frac{1}{2}$  inches of Trinidad asphalt wearing surface and  $1\frac{1}{2}$  inches of asphaltic cement concrete binder on a 6-inch Portland cement concrete base, laid with a ten years' maintenance guarantee clause. This section is from the bridge over the Boston and Albany Railroad to the north side of Camden St.

The second section, from the north side of Camden St. to about 60 feet north of Station St., will be resurfaced with  $1\frac{1}{2}$  inches of asphalt wearing surface on  $1\frac{1}{2}$  inches bituminous concrete binder, laid on a 6-inch Portland cement concrete base, with ten years' maintenance guarantee.

*Washington St.*, from Beach St. to Milk St., is to be resurfaced with wood block pavement on a 6-inch Portland cement concrete base. On the surface of the concrete there will be spread a bed of cement mortar one-half inch thick. On this mortar surface the blocks are to be laid with the grain vertical. These wooden blocks are a hard pine treated with a preservative. They are laid with a close joint, presenting a smooth surface and comparing favorably with other smooth pavements. The surface is impervious to water, thereby improving the sanitary conditions of the street. A new track is being laid by the Boston Elevated Railway Co. The ties are being laid on a continuous concrete girder. This is the most advanced form of street railroad construction, and is expected to increase the durability of the rail and obviate the necessity of frequent repairs.

**Boston Transit Commission.**—Work is progressing on the Washington-St. Tunnel from about 100 feet north of State St. to near the Relief Station in Haymarket Sq.

**Boston Elevated Railway.**—**ELEVATED CONSTRUCTION.**—*Sullivan Sq. car yard.*—The steel structure for this yard is erected complete; the reinforced concrete floor is now under construction, about one-fourth of the area being completed. The track work is already under way; the special work for four tracks will soon be installed, and the balance of track laying will be substantially completed this month. Tracks for the surface cars under



this structure are partly completed, a portion being in use for storage.

*Forest Hills Extension.*—The elevated structure is now erected as far as Cornwall St., and by the end of the month should be at Stony Brook. At this point two special foundations, 28 feet deep, are to be constructed in connection with the work on the new conduit for Stony Brook. One of them is a cantilever foundation, of special construction to prevent any load from the elevated structure being transmitted to the arch of the new conduit. Track work on this extension will begin early in the month and pushed as rapidly as possible.

*SURFACE LINES.*—New track is being laid on Beacon St., near Massachusetts Ave., on a concrete base. The concrete is carried down 6 inches below the ties and for a distance of two feet from their ends, and arched in between the ties six inches thick for a height sufficient to lay wooden block paving on top of it. The wooden blocks are grouted in cement in the same manner as stone paving. This is done to prevent water and moisture from working down into the rail and causing the frost to heave and distort the track as has been the experience heretofore. This method of construction will be adopted on the new track to be laid on Washington St. from Essex St. to Milk St.

*MISCELLANEOUS.*—Railroad bridge at Main St., Sullivan Sq., over the Boston & Maine Railroad, is being strengthened, heavy steel girders replacing present construction.

Tracks in the parkways on the curves are being elevated on the outer rail and guards provided on the inner rail.

Both tracks over the new Cambridge bridge are now in operation.

*Boston & Albany Railroad.*—*ABOLITION OF GRADE CROSSINGS.*—*East Boston.*—Excavation north of Maverick St. to Chelsea Creek has been completed, and trains are running on the new location. Abutments for Maverick, Porter, Prescott, Bennington and Curtis Sts. are built. Bennington St. Bridge is open to public travel. Curtis St. is being surfaced and bridge being erected. Maverick, Porter and Prescott Sts. are nearly filled to sub-grade.

*Newton Centre.*—At Newton Centre the masonry walls are complete with the exception of a few ditch walls, which will be built after the steam shovels go through the work on the second cut. A reinforced concrete wall, about 450 ft. long is under con-

struction. The Railroad Company is busy with the excavation, which is being done with two steam wheels.

*Maple Grove, Mass.*—On the Pittsfield and North Adams branch. The masonry is all completed; at present, grading and rip-rapping on the side slopes are being done.

*Reservoir Road.*—The excavation for the new road is going on and stone ballast will soon be laid in the foundation.

MISCELLANEOUS.—*Kneeland St. Warehouse, Boston.*—Benjamin Fox, Contractor. This building, consisting of brick walls, reinforced concrete floors and columns, is being rushed to completion before cold weather sets in. Two shifts of workmen are employed for a day and night gang, which proves, in this class of work, to be most satisfactory. At present the fifth floor is completed, and forms for the sixth floor are being placed.

*Clyde St. Pier, East Boston.*—Dredging is under way and the foundation piles for a sea wall are being driven. Gerry & Northup, Contractors, Boston.

*Beaconsfield Station, Brookline.*—Newton Highlands Branch. Work on the superstructure has been let to Benjamin Fox, Boston. The walls will be constructed of field stone with lichens, moss and weathered face. This will give the whole a rustic effect when completed.

**Boston & Maine Railroad.**—Abolition of grade crossing at Prison Point is under construction; masonry piers for the work south of old draw-bridge are partly completed.

**Milford, Mass.**—Sewage disposal plant, consisting of a concrete settling tank and 10 acres of sand filters under construction. Bruno, Salomone & Pettiti, Contractors. F. A. Barbour, Engineer.

**Springfield, Mass.**—Small, slow sand water filters being built. H. A. Hanscom, Contractor. F. A. Barbour, Engineer.

**Peabody, Mass.**—Reinforced concrete settling tanks being built at the American Glue Works. C. E. Trumbull & Co., Contractors.

Brick sewer also being built at the same place. Size of sewer, 36 in. x 30 in. M. McDonough, Contractor.

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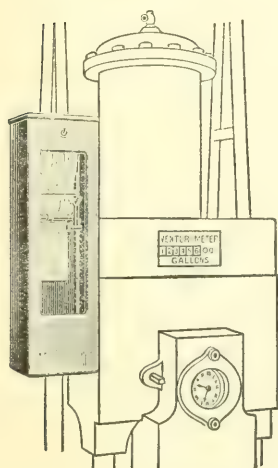
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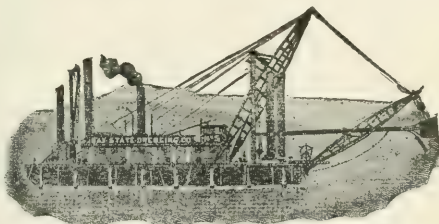
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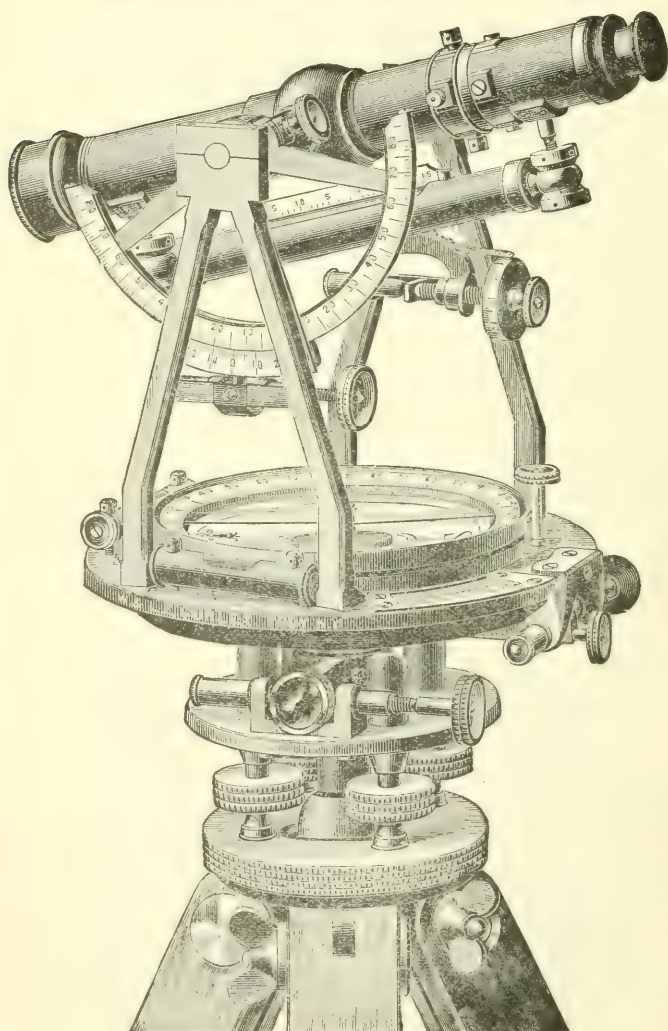
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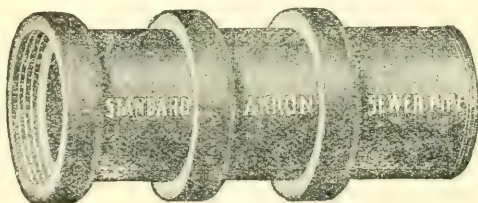
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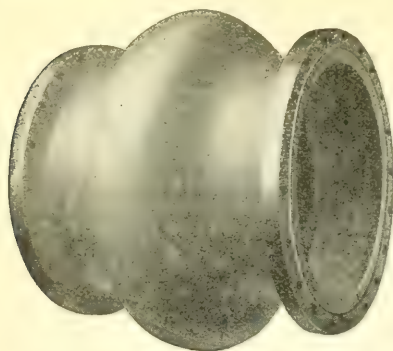
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# BOSTON SOCIETY OF CIVIL ENGINEERS.

ORGANIZED JULY 3, 1848.

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## MONTHLY BULLETIN.

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NEW SERIES.

NOVEMBER, 1906.

No. 6.

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### REGULAR MEETING.

A regular meeting of the Boston Society of Civil Engineers will be held on Wednesday, November 21, 1906, at 7.30 o'clock P. M., in

CHIPMAN HALL, TREMONT TEMPLE, BOSTON.

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Mr. F. A. Kummer, Chief Engineer, United States Wood Preserving Company, will read a paper on "The Development of Wood Pavements," illustrated by lantern slides.

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BUSINESS OF THE MEETING: To ballot on the applications for membership as announced in this notice.

S. E. TINKHAM, *Secretary*.

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### EXCURSION.

The excursion on Thursday last to inspect the wood pavement being laid along Washington St. was not satisfactory on account of the state of the work. The Committee has therefore arranged for a second excursion on **Wednesday, Nov. 21, 1906.**

Members will meet at the corner of Washington and Milk Sts., in front of the Old South Church, at 2 P. M. Arrangements have been made with the Contractors and the City, so that a thorough inspection of the work may be made. The U. S. Wood Preserving Company are furnishing the wooden blocks, and



Coleman Bros. are placing them on a concrete base. The Boston Elevated Railway is also engaged on its special concrete construction along this line.

Members are requested to invite to this excursion all who may be interested in such work.

## EXCURSION COMMITTEE.

### CANDIDATES FOR MEMBERSHIP.

To be balloted on at meeting November 21, 1906.

#### AS MEMBERS.

RAYMOND CLEVELAND ALLEN, Manchester, Mass., (b. 1877). Educated at the common schools of Manchester and the High School of Gloucester. Graduated from Brown University in 1897, with degree of B. S., having specialized in civil engineering studies. Opened a general engineering and surveying office in Manchester, Sept., 1897. Since then has carried on work of said office, and performed most of the engineering work of the Town of Manchester. Has superintended considerable construction work, designed and superintended roads, piers, &c. At present, as above, in general practice at Manchester, Mass. Recommended by F. C. Coffin, F. B. Rowell, A. D. Fuller and Stephen Child.

GEORGE EDWARD HARKNESS, Boston, (b. 1872). Graduated from Mass. Inst. of Technology in 1876, civil engineering course. Summer of 1895 with City of Medford, as inspector on sewer construction, Oct., 1890, to June, 1897, with Boston Transit Commission, on subway, as inspector; July, 1897, to June, 1900, transitman on Charlestown Bridge; July, 1900, to March, 1901, transitman, and April, 1901, to date, assistant engineer on Cambridge Bridge. Recommended by M. G. Woodward, William Jackson, F. H. Fay and S. H. Thorndike.

## MINUTES OF MEETINGS.

### OCTOBER MEETING OF THE SOCIETY.

A regular meeting of the Society was held at Chipman Hall, Tremont Temple, on Wednesday, October 17, 1906, at 8 o'clock p. m. President Frank W. Hodgdon in the chair; thirty-five members and visitors present.

The records of the last regular meeting and of the special meeting of October 5, were read and approved.

Messrs. John R. Rablin, John S. Rankin and Edward B. Richardson were elected members of the Society and Mr. Claude A. Palmer was elected an associate.

The President announced the deaths of the following members

of the Society: John E. Cheney, who died Sept. 25, 1906, and Nelson Spofford, who died October 3, 1906; and on motion it was voted to appoint committees to prepare memoirs. The President has appointed the following as these committees: On memoir of John E. Cheney, Messrs. E. D. Leavitt, G. F. Swain and F. H. Fay; and on memoir of Nelson Spofford, Messrs. Frederick Brooks and Richard A. Hale.

The President then introduced as the speaker of the evening, Mr. Charles Moore, Chairman of the Board of Directors of The Submarine Signal Company, who gave an informal talk on "The Submarine Signal", which was illustrated by lantern slides. Prof. Lucian I. Blake, Consulting Engineer of The Submarine Signal Company, and Mr. Arnold B. Johnson, Chief Clerk of the U. S. Lighthouse Board, also gave very interesting accounts of the working of the submarine signals.

On motion of Mr. E. W. Howe it was voted: That the Society express its sincere appreciation of the courtesies extended to it by The Submarine Signal Company on the trip down Boston Harbor to inspect the operation of the submarine signal system and for the interesting illustrated description to which we have just listened.

### SANITARY SECTION MEETING.

A regular meeting of the Sanitary Section was held at the Copley Sq. Hotel, Wednesday evening, Oct. 10, 1906, Vice-Chairman Weston presiding. Forty-two members and guests were present.

A paper upon "The Relation of the Suspended Matter in Sewage to the Problem of Sewage Disposal" was presented by H. P. Eddy and A. L. Fales. The paper was illustrated with lantern slides and was discussed by Messrs. R. S. Weston, George A. Carpenter, H. W. Clark, C.-E. A. Winslow, E. B. Phelps and others.

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### APPLICATIONS FOR MEMBERSHIP.

The following applications for membership have been received, and are now before the Board of Government for approval. Members having information which will assist the government in its consideration of these applications are requested to communicate at once with any member of the Board. Communications will be regarded as confidential and for the use of the Board alone,

**JOHN KING BARKER**, Springfield, Mass., (b. 1864). Graduated in civil engineering course, University of Illinois, in 1892. Foreman of pipe laying in 1886, of foundation work in 1887 and of masonry in 1888; also foreman on foundation work and pipe laying during summers of 1891 and 1892; inspector of pile driving and superintendent of repairs on dams in 1893, and on office work for Edward Sawyer, C. E.; on weir measurement, 1894; construction work, 1895 and 1896. Began private practice in 1896, opening an office in Springfield, and since then has been engaged in land surveying, foundation work, mill construction and hydraulic investigations. Recommended by Wm. Wheeler, G. N. Merrill, F. P. Cobb and W. H. Sawyer.

**EDWARD BURR**, Boston, (b. 1859). 1874-1878 took a three and one-half years of mining engineering course at Washington University, St. Louis, Mo. Cadet U. S. Military Academy, West Point, N. Y., July 1, 1878, and graduated in 1882; Second Lieutenant, Corps of Engineers, U. S. Army, July 1, 1882; First Lieutenant, April 16, 1883; Captain, Sept. 18, 1894; Major, Jan. 29, 1903; Lieutenant-Colonel, Second U. S. Volunteer Engineers, June 10, 1898; mustered out of Volunteers, May 16, 1899; at Engineers' School of Application, Willets Point, N. Y., Oct., 1882 to Oct., 1884; assistant on river and harbor improvements in Portland, Oregon district, Dec., 1884 to Oct., 1885; Engineer officer, Military Department of the Columbia, Oct., 1885 to Dec., 1886; Dec., 1886 to Nov., 1891, assistant on river and harbor improvements in Portland, Oregon district, including local charge, July, 1887 to Nov., 1891, of plans and construction of canal at Cascades of Columbia River; Aug. to Nov., 1889, prepared detailed plans of boat railway at The Dalles, Columbia River, Ore.; Nov., 1891 to Nov., 1894, in charge of river and harbor improvements, Norfolk, Va. district; Aug., 1892, to May, 1893, prepared set of plans for boat railway at The Dalles; 1893 to 1895 superintended shop construction of steel lock gates of his design for canal at Cascades of Columbia River; Nov., 1894, to May, 1895, assistant to the Engineer Commissioner, D. C., having charge of water supply, street lighting, building inspection and of conduits and aerial wires in public streets; May, 1898, in temporary charge of Washington Aqueduct; June to July, 1898, participated in campaign against Santiago de Cuba in command of Engineer Battalion, 5th Army Corps; Aug. to Nov., 1898, with 2nd Regt., U. S. Vol. Engineers as Lieutenant-Colonel in camps in United States; and Oct. to Nov., 1898, engineer officer of 2nd Army Corps; Dec., 1898, to Mar., 1899, on duty in the office of the Chief of Engineers; Mar., 1899, to Nov., 1901, in charge of river and harbor improvements, St. Louis, Mo. district, including improvement of the Mississippi River from the Missouri to the Ohio; Nov., 1901, to Mar., 1903, instructor at the Engineer School, U. S. A., Washington Barracks, D. C.; Apr., 1903, to June, 1906, commandant of the Engineer School and in command of the 2nd Battalion of Engineers, Washington Barracks, D. C.; Aug. to Sept., 1904, engineer officer and acting Chief of Staff, 1st Maneuver Division, Manassas, Va.; June, 1906, to date, engineer of the 1st and 2nd Lighthouse Districts, and in charge of the river and harbor improvements and fortifications in the Boston, Mass. district, including the defenses of Boston and the river and harbor improvements on the Massachusetts coast and on Lake Champlain. Member American

Society of Civil Engineers and member Washington, D. C., Society of Civil Engineers. Recommended by E. M. Blake, R. S. Weston, T. T. H. Harwood and A. E. Hatch.

WILBUR WARD DAVIS, Melrose, Mass., (b. 1877). Student at the Mass. Institute of Technology, 1896-99. Began work with the Metropolitan Park Commission in 1899, became an assistant engineer on construction, and remained there until 1902, when he went into the employ of the Boston Transit Commission on the construction work of the East Boston Tunnel and later that of the Washington-St. Tunnel, where he is now employed. Recommended by H. A. Carson, E. S. Davis, L. L. Street and L. B. Manley.

BURTON IRVING DRISKO, Boston, (b. 1885). Graduated from Roxbury Latin School in 1903 and from Sheffield Scientific School of Yale University in 1906. At present with W. F. Kearns & Co., Reinforced Concrete Contractors, Boston. Recommended by L. L. Street, B. W. Rawson, F. A. Snow and L. C. Wason.

HARRY WILFRED FITTS, Allston, Mass., (b. 1876). Graduate of high school, Manchester, N. H., prepared for college at Phillips Exeter Academy, attended Harvard College one year, then went to Dartmouth College, completed one year in the Thayer School of Civil Engineering. From April, 1902, to July, 1904, was in drafting room of Brooklyn, N. Y., Plant of American Bridge Co.; from July, 1904, to Sept., 1905, was in estimating and designing department of American Bridge Co., at 42 Broadway, New York City; from Sept., 1905, to Oct., 1906, was in engineering department, N. Y., N. H. & H. R. R., at Boston, designing structural steel for the Readville locomotive repair shops; and from Oct., 1906, to present date, in charge of estimating and designing department, New England Structural Co., 110 State St., Boston. Recommended by J. R. Worcester, E. B. Stearns, G. T. Sampson and J. P. Snow.

EDWARD HOLMES, Boston, (b. 1881). Graduated from Cornell University, College of Civil Engineering, 1905. Assistant engineer, sewer construction, Newton, N. J., 1905; assistant engineer on surveys, Ithaca-Dryden R. R., 1905; engineer in charge of sewer construction in Newton, N. J., 1906; engineer in charge of sewer construction, Ravenna, Ohio, 1906; and since Oct. 1, 1906, engineer Simplex Foundation Company. Recommended by G. T. Sampson, L. L. Street, E. M. Blake and C. W. Sherman.

ELBERT EMERSON LOCHRIDGE, Springfield, Mass., (b. 1877). Beloit College (Wis.) S. B. 1898, University of Chicago, Bacteriological P. G. course, 1900, Mass. Inst. of Technology S. M. (course completed 1903), degree '05. Professional work on water supply under Prof. E. G. Smith, Beloit, Wis., 1899-1902, including work on filter-plants at Davenport, Ia., Cedar Rapids, Ia., Binghamton, N. Y., Warren, Ohio, Brooklyn, N. Y. (two filters, 6 months, 1902), Kankakee, Ill.: typhoid studies, Ashland, Wis., Rock Island, Ill., etc., also work on other features at several other cities; 1903, resident engineer for S. M. Gray and G. W. Fuller at Springfield, Mass. (Ludlow Reservoir), on experimental filters; fall 1903 and spring, 1904, with Mo. and Chicago Drainage Canal suit in United States Supreme Court and from June, 1904, to present time, engineer, Spring-



field Water Department. Recommended by X. H. Goodnough, W. S. Johnson, A. T. Safford and R. A. Hale.

THOMAS MACKELLAR, Boston, (b. 1880). Four years in department of civil engineering at Cornell University, class of 1905. Assistant engineer, P. McK. and C. R. R., Cornellville, Pa., summer of 1903; head draftsman, Simplex Concrete Piling Company, 1905; engineer Simplex Foundation Company, Philadelphia, from March 1, 1906, to May 1, 1906; and since May 1, 1906, manager, Boston office, Simplex Foundation Company. Recommended by G. T. Sampson, L. L. Street, E. M. Blake and C. W. Sherman.

LESLIE WALKER MILLAR, Newton, Mass., (b. 1879). Graduate of Mass. Inst. of Technology, 1902. Draftsman Associated Factory Mutual Fire Insurance Companies, 1902; Inspector of Building Construction, Boston Wharf Co., 1902-1904; with Charles G. Sherman, Consulting Engineer, Boston, 1904; and since 1904 Inspector Station Engineering Dept., Edison Electric Illuminating Co. of Boston. Recommended by R. E. Curtis, I. E. Moulthrop, C. H. Parker and L. S. Cowles.

THOMAS EDWARD PENARD, Everett, Mass., (b. 1878). Attended the schools in Dutch Guiana until 1890; came to the United States in 1890 and attended public schools of Everett, Mass., graduating from its High School in 1896. Graduated from Mass. Inst. of Technology, electrical engineering course, in 1900. Employed as draftsman with New England Structural Co. from Sept., 1900, to Nov., 1900; draftsman with Norcross Brothers, Worcester, from Nov., 1900, to Feb., 1901; with Edison Co., from Feb., 1901, to present time. In charge of Dept. of Mathematics, Boston Y. M. C. A. evening schools since 1905. Recommended by W. J. C. Semple, I. E. Moulthrop, Sidney Hosmer and R. E. Curtis.

JOHN JOSEPH ROURKE, Lynn, Mass. (b. 1874). Educated in public schools and graduate of Lynn Classical High School. Entered the employ of Boston and Maine R. R. in 1893, and has been since that time in Engineering Department of that road, except in 1902, when he was in Engineer's Department of N. Y. C. & H. R. R. R. Has been in charge of separation of grades work, railroad yards, bridges and buildings construction, dredging, wharves, etc. Is now an assistant engineer B. & M. R. R. Recommended by T. P. Perkins, J. P. Snow, W. H. Norris and F. B. Rowell.

JOHN ALVAH STARR, Watertown, Mass., (b. 1869). Graduated from University of Maine, 1896, civil engineering course. Employed by the Town of Watertown, Mass., as assistant engineer on sewer construction and street widening, July, 1896, to Sept., 1897; by the Metropolitan Park Commission as head of party and assistant engineer on survey and construction work, Sept., 1897, to Oct., 1902; by Arthur F. Gray, Mill Architect, Boston, as assistant engineer on survey for proposed manufacturing plant, Oct., 1902, to Jan., 1903; and by Coleman Brothers, Contractors, Boston, as civil engineer and superintendent, Jan., 1903, to present time. Recommended by H. A. Carson, L. B. Manley, L. L. Street and E. S. Davis.

## LIST OF MEMBERS.

## ADDITIONS.

CLAUDE A. PALMER	. . .	405 Post Office Sq. Bldg., Boston.
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EDWARD B. RICHARDSON	. . .	534 Albany Bldg., Boston.
EDWARD A. TUCKER	. . .	683 Atlantic Ave., Boston.

## CHANGES OF ADDRESS.

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T. F. RICHARDSON	. Ch. Engr,	Federal Const. Co., Rockingham, N. C.
C. S. ROBBINS	. . .	11 East State St., Gloversville, N. Y.
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L. B. VAUGHAN	. . .	172 Downs St., Kingston, N. Y.
J. B. WRIGHT	. . .	16 Arnold Ave., Amsterdam, N. Y.

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## Freeman Clarke Coffin.

Vice-President, Boston Society of Civil Engineers.

Chairman Sanitary Section, Boston Society of Civil Engineers.

Born September 14, 1856.

Joined the Society April 21, 1886.

Died November 11, 1906.

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### SANITARY SECTION.

#### UNIFORM SEWERAGE STATISTICS.

The schedule for uniform statistics relating to sewerage construction and maintenance, recommended by a committee appointed by the Section, has been printed for distribution, and copies have been sent to members of the Section.

Those who are in any way connected with the construction or operation of sewerage systems are urged to do what they can to have this form adopted. It is hoped that the Section will be able to present each year a summary of the statistics received from various cities and towns, in such a form that they will be of great value.

Additional copies of the blank forms can be obtained by applying to the Clerk of the Section, at Room 715, Tremont Temple.

WILLIAM S. JOHNSON, *Clerk.*

## LIBRARY NOTES.

### RECENT ADDITIONS TO THE LIBRARY.

- Boston, 31st Annual Report, Park Commissioners, 1905.  
 Detroit, Mich., Annual Report Board of Water Commissioners, 1906.  
 Melrose, Mass., Annual Report Public Works Dept., 1905.  
 Philadelphia, Report of Dept. Public Works, 1905.  
 Somerville, Mass., Annual Reports for 1905.  
 San Francisco, Earthquake and Fire of 1906, Brief History of the Disaster by A. L. A. Himmelwright, C. E.  
 Massachusetts, Annual Report of State Board of Health, 1905.  
 New Jersey, Annual Report of State Geologist for 1905.  
 Principles of the Manufacture of Iron and Steel, by I. L. Bell, 1884.
- 

### GIFT OF CLEMENS HERSCHEL, C. E.

- Astronomie Populaire, by Auguste Comte.  
 At Home and in War, by A. Verestchagin.  
 Baird, Charles, and Baird, Francis, Memoir of, by T. Tower.  
 Beau, Le, by Ph. Gauckler.  
 Bessemer, Sir Henry, Autobiography.  
 Brunel, I. K., Life of, by Isambard Brunel.  
 Brunel, Sir M. I., Life of, by Richard Beamish.  
 Canals and Railroads of U. S., by H. S. Tanner.  
 Civil and Military Engineers of America, by C. B. Stuart.  
 Coals, Story of American, by W. J. Nicolls.  
 Commercial and Industrial Spain, by George Higgin.  
 De Lesseps, Ferdinand, Biographical Notice of, by Henry Mitchell.  
 Dreamer in Paris, A, by W. J. Nicolls.  
 Eminent Engineers, by D. Goddard.  
 Engineering Popularly and Socially Considered, by Haldane.  
 England and Canada, a summer tour between old and new Westminster, by Sanford Fleming.  
 Englishmen, A Group of, by E. Meteyard.  
 Ericsson, Life of John, by W. C. Church; vols. 1-2.  
 Galileo, Life of, by Sister Maria Celeste.  
 Haupt, Gen. Herman, Reminiscences.  
 History of Inventions, by J. Beckmann; vols. 1-2.  
 Im Strom unserer Zeit, by von Max Eyth; 3 vols.

- India and Indian Engineering, by J. G. Medley.  
 Ingenieurtechnik im Alterthum, by Curt Merckel.  
 Inland Navigation and Railroads of Great Britain, by J. Priestley.  
 In Old New York, by T. A. Janvier.  
 Jenkin, Fleeming, by R. L. Stevenson.  
 Laws of Trade, by C. Ellet.  
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 Locke, Life of Joseph, by J. Devey.  
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## NEW ENGINEERING WORK.

(Under this head the Excursion Committee proposes to present each month a brief resume of engineering work in progress in New England, as far as such information is readily obtainable. The assistance of members is desired, and items of interest will be gladly received. Such items are intended to include not only works of exceptional magnitude or containing novel features, but also engineering construction work of all kinds and all degrees of magnitude. Notes should be in the hands of the Committee not later than the 2nd Wednesday of each month. The thanks of the Committee are due to the members who have furnished data for the Bulletin.—E. M. BLAKE, Secretary, Excursion Committee, 8 Beacon St., Boston.)

**Commonwealth of Massachusetts.**—**METROPOLITAN PARK COMMISSION.**—*Charles River Reservation.*—Building to sub-grade roadway through United States Arsenal Grounds, Arsenal St., to North Beacon St., and building masonry river wall.

*Furnace Brook Parkway.*—Surfacing and finishing Furnace Brook Parkway from Adams St., to Blue Hills Reservation.

*Lynn Fells Parkway.*—Concrete abutments for Boston and Maine Railroad Bridge over Parkway.

Building to sub-grade Parkway from Middlesex Fells Reservation to Green St., Melrose.

*Mystic River Reservation.*—Reinforced concrete masonry bridge over Mystic River, near Armory, Medford.

Reinforced concrete masonry bridge over Mystic River, at Auburn St., Medford.

*Quincy Shore Reservation.*—Building to sub-grade Quincy Shore Reservation from Atlantic St. to National Sailors' Home.

**HIGHWAY COMMISSION.**—The State highway work is now being done in the following cities and towns:

Becket,	Falmouth,	Middleborough,	Richmond,
Bedford,	Hatfield,	Montague,	Rockport,
Burlington,	Haverhill,	Northampton,	Scituate,
Canton,	(Bridge)	Norton,	Spencer,
Chicopee,	Holliston,	Oxford,	Tewksbury,
Deerfield,	Hudson,	Pittsfield,	Truro,
Dighton,	Huntington,	Rehoboth,	Westborough.
Eastham,	Mansfield,		

**CHARLES RIVER BASIN COMMISSION.**—At the locks work is going on at the upper gate recess and at the extreme lower end, which is the drawbridge foundation. Some more of the sub-structure metal work has been put in place during the past month. The granolithic surface near the upper end of the locks is now being put on.

A part of section 1 of the Boston Marginal Conduit, included in the contract of Holbrook, Cabot & Rollins, has been completed and a considerable amount of the filling between the old Charles Bank wall and the easterly side of the lock has been done.

At the sluices a considerable amount of concrete has been put in during the last month and most of it is now at elevation 10.

Plans and specifications for the next section of the Boston Marginal Conduit and Boston Embankment are being prepared. This section will extend practically to the Fens and will complete that work with the exception of a short section opposite the Fens and including the gate house. The contract for section 4 of the Boston Marginal Conduit and section 2 of the Embankment was awarded on Oct. 29 to Holbrook, Cabot & Rollins for \$198,890.

**City of Boston.**—ENGINEERING DEPARTMENT.—CAMBRIDGE BRIDGE.—*Boston to Cambridge.*—Two of the four large, ornamental granite towers on the central piers are completed except for the doors, windows, ornamental metal work and interior circular stairways. The stonework of the two remaining towers is nearly finished. Work is in progress upon the four smaller towers of the abutments. The ornamental cast-iron railing has been erected upon the southerly sidewalk of several spans. The granolithic sidewalks of the bridge are complete with the exception of small areas, which cannot be laid until the completion of the towers. Since August first about forty painters have been employed in painting the 8000 tons of steel superstructure. Ten of the eleven arch spans have received the first field coat of dark green paint and five spans have also been painted the second coat of a somewhat lighter shade of green. The stone masonry upon both wings of the Boston Abutment and the northerly wing of the Cambridge Abutment is completed and work upon the southerly wing of the latter will be done after the removal of the temporary West Boston Bridge. The paving and regulating of the Boston Approach is completed. When the work of paving and regulating the Cambridge Approach, now underway, is finished, the bridge will be open to highway as well as street-car travel.

**Boston Transit Commission.**—Work is progressing on the Washington-St. Tunnel from near State St., to near the Relief Station in Haymarket Square.

**New York, New Haven & Hartford R. R.**—FREIGHT HOUSES, SOUTH BOSTON FLATS—*Concrete Piles.*—On Sept. 1, 1906, the Simplex Foundation Company began the installation of

a concrete pile foundation for one of the new brick freight houses of the New York, New Haven & Hartford Railroad at C and Fargo streets, South Boston.

The work consisted of driving one hundred and ninety-one standard 16-inch Simplex Concrete Piles varying in length from 19 to 39 feet, according to the nature of the ground, which consists of from 15 to 21 feet of loose top soil overlying a sloping stratum of stiff, blue clay.

The piles are capped with reinforced concrete footings along the wall lines, and with plain concrete footings at those points where interior columns carrying the roof are to be supported. The superstructure is a one-story, brick freight house, 512 by 50 feet, subdivided by lateral partitions into four panels, and so equipped that each panel is practically a separate freight house in itself. The walls and roof loads are carried by the piles, the floor load being supported upon puddled and rolled ground between the column footings and outer walls.

At the request of the Building Commission, a pile chosen at random by the Commission was subjected to a test on October 25, after the pile had remained in the ground one month, and the concrete cap resting upon it had set for ten days. The pile tested happened to be the one least liable to stand a fair test, being several feet shorter than others in the immediate vicinity, and showing a record of a smaller number of hammer blows than the other piles in the same panel. The actual load which this pile will carry is a portion of the roof load plus the weight of a wooden column and the concrete footing, aggregating in all, about ten tons.

The test consisted in loading the pile with steel rails, in increments of about  $4\frac{1}{2}$  tons until an appreciable settlement took place, and the results are as follows: No appreciable settlement occurred until the load had reached 21.4 tons, when a settlement of .007 of a foot was observed. The load was then gradually increased to 35 tons, three and a half times the load to be carried by the pile, and a settlement of .059 of a foot was observed. The test was witnessed and the loads and settlements verified by Deputy Commissioner Mahoney for the City of Boston. Others present were Mr. George T. Sampson, Division Engineer of the N. Y., N. H. & H. R. R., Mr. F. L. Murray, Inspector for the Railroad, and representatives of the Simplex Foundation Company.

A brief outline of the method of installing Simplex Concrete Piles is co-relative with this description, and is as follows: A hollow steel cylinder 16 inches outside diameter and  $\frac{3}{4}$  inch thick with a



blunt detachable point, is driven to the required depth and filled with concrete, consisting of one part Portland Cement,  $2\frac{1}{2}$  parts sand, and 5 parts  $1\frac{1}{4}$ -inch crushed stone, the concrete being mixed wet enough to insure puddling and the proper filling of all voids. A special design of bucket is used, which drops  $3\frac{1}{2}$  cubic feet of concrete into the form in such a manner that the concrete falls with practically no disintegration and rams itself into place more effectively than could be accomplished with any ordinary tamper. The form when filled, is pulled out of the ground, and an indicator shows whether or not the concrete is properly filling the voids caused by the withdrawal of the form. By this method there is left in place a ragged monolithic concrete column 16 inches in diameter from top to bottom, presenting a highly frictional surface to the surrounding earth, and an end bearing of 201 square inches.

The factors involved in determining the bearing value of a Simplex Concrete Pile are embraced in an empirical formula as follows:—

$$B = \frac{2WH}{P+1} + \frac{2WHa}{(p+1)Af}$$

in which

B = Safe Bearing value of the finished pile.	A = End Area of pile in sq. feet.
P = Penetration at last blow in inches.	a = Side Area of pile in sq. feet.
p = Average penetration of all blows in inches.	W = Weight of hammer in tons.
f = Coefficient adopted from practice and experiment = 40.	H = Height of fall in feet.

With reference to the above values as applied to the present work in Boston, it can be added that W, the weight of the hammer, is 1.65 tons, and H, the fall, is ten feet.

**FREIGHT HOUSE, No. 4, SOUTH BOSTON FLATS**—The contract for the moving and remodeling of No. 4 Freight House, situated between B, C and Fargo Sts., South Boston, has recently been awarded to Isaac Blair & Co. The freight house is 1,000 feet long and 60 feet wide, and rests on spruce piles. The work consists in cutting the building in two sections of about 500 feet long. One section is to be moved about 200 feet. The second section is to be moved about 500 feet and turned around. The two new buildings will rest on spruce piles. There will be three new brick fire walls in each building, resting on concrete pile foundation. The fire walls will extend two feet above the roof and will be of 12-inch brick work.

**Boston & Albany Railroad.**—ABOLITION OF GRADE CROSS-

INGS.—*Newton Center*.—Two steam shovels have excavated the southerly half of the cut and exposed the trench walls. This work, as now seen, indicates what the final construction will be, and the various stages of progress to be made. Passenger trains are running on southerly single track while excavation is being done on the northerly half at present. The contractor, The Charles R. Gow Company, is building a reinforced concrete curtain wall 12 feet high and 500 feet long, which is built on a pile foundation. The passenger station will next be underpinned and otherwise altered.

*East Boston*.—The railroad company is laying yard tracks and rock ballasting main tracks. A pair of concrete abutments containing 2,300 yards are in process of construction at Saratoga St. A solid concrete floor with an asphalt surface is being laid on the Curtis St. bridge.

*Maple Grove, Mass.*—On Pittsfield and North Adams branch grading for the approaches to the bridge is being done.

MISCELLANEOUS.—*Kneeland St. Warehouse, Boston*.—The brick walls for the seventh story are being built and the roof will be completed in about two weeks. The waterproofing of basement is practically finished. The basement floor, reinforced with Clinton Welded Metal, is under construction.

*Clyde St. Pier, East Boston*.—Stone masonry walls are being built at the head of docks, also pile driving for support of pier building. Dredging for adjacent docks is in progress.

*Beaconsfield Station, Brookline*.—NEWTON HIGHLANDS BRANCH.—The masonry for superstructure is nearly complete. The frame is up and the roof is nearly ready to receive tile. The granolithic floor will be laid soon, as well as the reinforced granolithic platform, which is about 330 feet long.

*Reservoir Road, Brookline, Mass.*—This roadway is having a telford base laid and grading is in progress.

**Boston Elevated Railway.**—ELEVATED CONSTRUCTION.—*Sullivan Sq. Car Yard*.—The reinforced concrete floor is practically completed, stringers for storage tracks are being laid and the rails are laid on a portion of the yard. Storage tracks for the surface cars are built and in use under the new elevated car yard.

*Forest Hills Extension*.—The elevated structure is erected as far as Garfield St., beyond Green St., or about to Stony Brook.

Foundations mentioned in last month's Bulletin are under

construction in conjunction with the work on the Stony Brook Conduit.

Track work is under way, ties are laid on both tracks from Guild St. to Townsend St., and south-bound track is laid to Marcella St. A temporary overhead trolley system for construction trains is in operation, material being brought from the general storage yard at Sullivan Sq.

**SURFACE LINES.**— Washington St. track, south-bound, Essex St. to Milk St., is under construction; the north-bound is completed and in operation. A description of this construction was given in last month's Bulletin.

Preparations under way for grade changes at the Dudley St. grade crossing of the N. Y., N. H. & H. R. R.

On Maverick and Orleans Sts., East Boston, tracks are under construction to provide an entrance to the East Boston tunnel when the bridge over the Boston & Albany R. R. is completed.

**Boston & Maine Railroad.**— **ABOLITION OF GRADE CROSSINGS.**— *Sterling Junction.*— Steel trusses are being erected to carry the highway and electric cars, and roads are under construction.

Work is also under way at South Acton, Williamstown and Ayer, on grade crossing changes.

At Prison Point the piers and abutments are nearly completed; the steel work is to be furnished by the Boston Bridge Works and will not be erected for some time yet.

**Miscellaneous.**— W. F. Kearns & Company are installing the unit system of reinforcement for the concrete floors in the Foss Garage Building on Newbury St., near Massachusetts Ave. The concrete and steel reinforcement for the first floor is now being laid and the columns and forms for the second story will be under way by the middle of the month.

Work is also being rushed by this company on a large building for The American Meter Company, at Albany, N. Y., including interior and exterior walls, floors, roofs, columns and beams. The building is to be four stories high, 220 feet by 150 feet, with one and two-story wings for boiler shop, blacksmith shop and stable attached to the main building.

The company has just completed a one-story reinforced concrete building for the Stanley G. I. Electric Manufacturing Company at Pittsfield, Mass.

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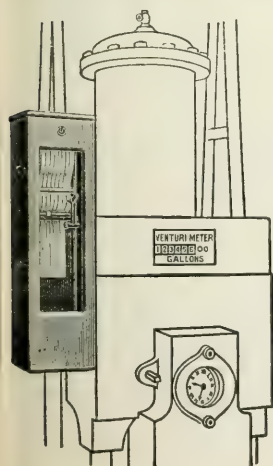
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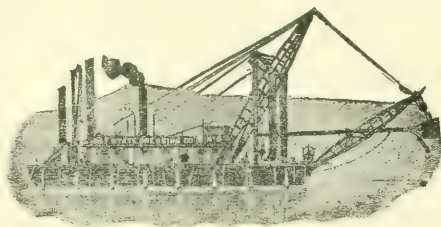
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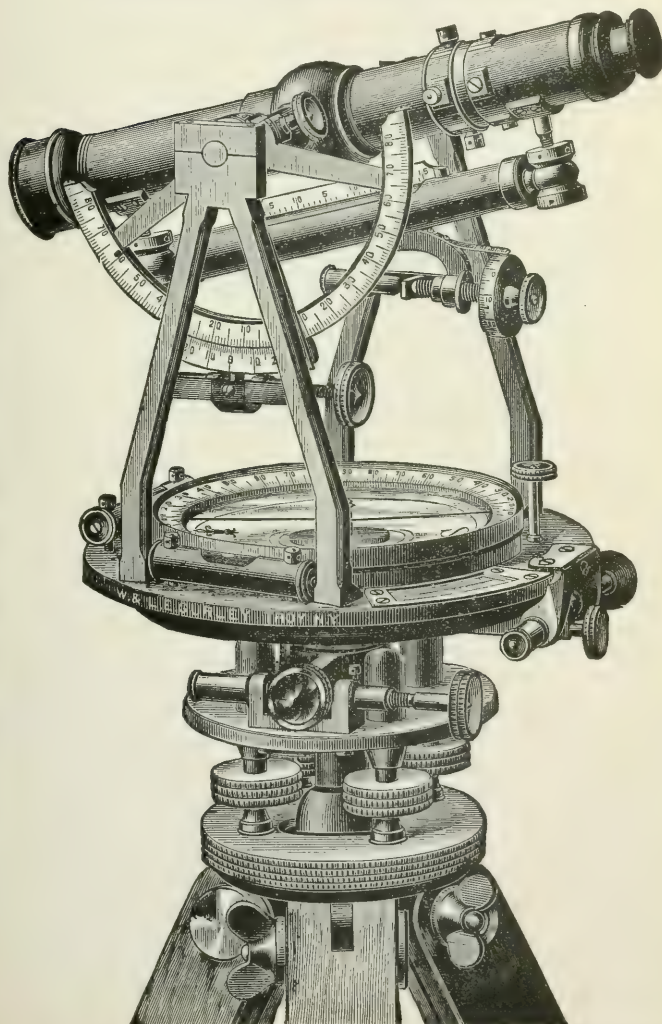
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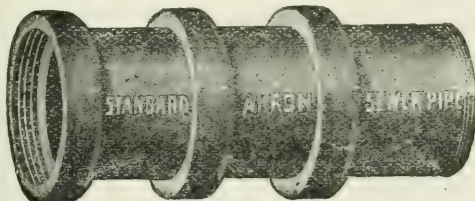
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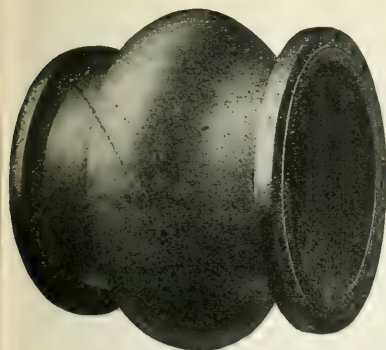
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

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**Massachusetts**—Athol, Beverly, Brockton, Brookline, Chicopee, Clinton, Concord, Dedham, Easthampton, Everett, Fall River, Greenfield, Hingham, Holyoke, Hyde Park, Lawrence, Lowell, Marblehead, Marlboro, Medford, Methuen, Milton, Newton, North Adams, Palmer, Revere, Stoneham, Waltham, Ware, Watertown, Winthrop, Worcester.

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# MONTHLY BULLETIN.

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NEW SERIES.

DECEMBER, 1906.

No. 7.

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## REGULAR MEETING.

A regular meeting of the Boston Society of Civil Engineers will be held on Wednesday, December 19, 1906, at 7.30 o'clock P. M., in

CHIPMÁN HALL, TREMONT TEMPLE, BOSTON.

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Mr. Paul Winsor, Chief Engineer of Motive Power and Rolling Stock, Boston Elevated Railway Co., will give an informal talk on "Gas Engines and Producer Plants as used by the Boston Elevated Railway Co."

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**BUSINESS OF THE MEETING:** To ballot on the applications for membership as announced in this notice.

To elect a Vice-President to fill a vacancy.

To receive report of Committee on Memoir of Freeman C. Coffin.

S. E. TINKHAM, *Secretary.*



## CANDIDATES FOR MEMBERSHIP.

To be balloted on at meeting December 19, 1906.

### AS MEMBERS.

**JOHN KING BARKER**, Springfield, Mass., (b. 1864). Graduated in civil engineering course, University of Illinois, in 1892. Foreman of pipe laying in 1886, of foundation work in 1887 and of masonry in 1888; also foreman on foundation work and pipe laying during summers of 1891 and 1892; inspector of pile driving and superintendent of repairs on dams in 1893, and on office work for Edward Sawyer, C. E.; on weir measurement, 1894; construction work, 1895 and 1896. Began private practice in 1896, opening an office in Springfield, and since then has been engaged in land surveying, foundation work, mill construction and hydraulic investigations. Recommended by Wm. Wheeler, G. N. Merrill, F. P. Cobb and W. H. Sawyer.

**EDWARD BURR**, Boston, (b. 1859). 1874-1878 took a three and one-half years of mining engineering course at Washington University, St. Louis, Mo. Cadet U. S. Military Academy, West Point, N. Y., July 1, 1878, and graduated in 1882; Second Lieutenant, Corps of Engineers, U. S. Army, July 1, 1882; First Lieutenant, April 16, 1883; Captain, Sept. 18, 1894; Major, Jan. 29, 1903; Lieutenant-Colonel, Second U. S. Volunteer Engineers, June 10, 1898; mustered out of Volunteers, May 16, 1899; at Engineers' School of Application, Willets Point, N. Y., Oct., 1882 to Oct., 1884; assistant on river and harbor improvements in Portland, Oregon district, Dec., 1884 to Oct., 1885; Engineer officer, Military Department of the Columbia, Oct., 1885 to Dec., 1886; Dec., 1886 to Nov., 1891, assistant on river and harbor improvements in Portland, Oregon district, including local charge, July, 1887 to Nov., 1891, of plans and construction of canal at Cascades of Columbia River; Aug. to Nov., 1889, prepared detailed plans of boat railway at The Dalles, Columbia River, Ore.; Nov., 1891 to Nov., 1894, in charge of river and harbor improvements, Norfolk, Va. district; Aug., 1892, to May, 1893, prepared set of plans for boat railway at The Dalles; 1893 to 1895 superintended shop construction of steel lock gates of his design for canal at Cascades of Columbia River; Nov., 1894, to May, 1895, assistant to the Engineer Commissioner, D. C., having charge of water supply, street lighting, building inspection and of conduits and aerial wires in public streets; May, 1898, in temporary charge of Washington Aqueduct; June to July, 1898, participated in campaign against Santiago de Cuba in command of Engineer Battalion, 5th Army Corps; Aug. to Nov., 1898, with 2nd Regt., U. S. Vol. Engineers as Lieutenant-Colonel in camps in United States; and Oct. to Nov., 1898, engineer officer of 2nd Army Corps; Dec., 1898, to Mar., 1899, on duty in the office of the Chief of Engineers; Mar., 1899, to Nov., 1901, in charge of river and harbor improvements, St. Louis, Mo. district, including improvement of the Mississippi River from the Missouri to the Ohio; Nov., 1901, to Mar., 1903, instructor at the Engineer School, U. S. A., Washington Barracks, D. C.; Apr., 1903, to June, 1906, commandant of the Engineer School and in command of the 2nd Battalion of Engineers, Washington

Barracks, D. C.; Aug. to Sept., 1904, engineer officer and acting Chief of Staff, 1st Maneuver Division, Manassas, Va.; June, 1906, to date, engineer of the 1st and 2nd Lighthouse Districts, and in charge of the river and harbor improvements and fortifications in the Boston, Mass. district, including the defenses of Boston and the river and harbor improvements on the Massachusetts coast and on Lake Champlain. Member American Society of Civil Engineers and member Washington, D. C., Society of Civil Engineers. Recommended by E. M. Blake, R. S. Weston, T. T. H. Harwood and A. E. Hatch.

WILBUR WARD DAVIS, Melrose, Mass., (b. 1877). Student at the Mass. Institute of Technology, 1896-99. Began work with the Metropolitan Park Commission in 1899, became an assistant engineer on construction, and remained there until 1902, when he went into the employ of the Boston Transit Commission on the construction work of the East Boston Tunnel and later that of the Washington-St. Tunnel, where he is now employed. Recommended by H. A. Carson, E. S. Davis, L. L. Street and L. B. Manley.

BURTON IRVING DRISKO, Boston, (b. 1885). Graduated from Roxbury Latin School in 1903 and from Sheffield Scientific School of Yale University in 1906. At present with W. F. Kearns & Co., Reinforced Concrete Contractors, Boston. Recommended by L. L. Street, B. W. Rawson, F. A. Snow and L. C. Wason.

HARRY WILFRED FITTS, Allston, Mass., (b. 1876). Graduate of high school, Manchester, N. H., prepared for college at Phillips Exeter Academy, attended Harvard College one year, then went to Dartmouth College, completed one year in the Thayer School of Civil Engineering. From April, 1902, to July, 1904, was in drafting room of Brooklyn, N. Y., Plant of American Bridge Co.; from July, 1904, to Sept., 1905, was in estimating and designing department of American Bridge Co., at 42 Broadway, New York City; from Sept., 1905, to Oct., 1906, was in engineering department, N. Y., N. H. & H. R. R., at Boston, designing structural steel for the Readville locomotive repair shops; and from Oct., 1906, to present date, in charge of estimating and designing department, New England Structural Co., 110 State St., Boston. Recommended by J. R. Worcester, E. B. Stearns, G. T. Sampson and J. P. Snow.

EDWARD HOLMES, Boston, (b. 1881). Graduated from Cornell University, College of Civil Engineering, 1905. Assistant engineer, sewer construction, Newton, N. J., 1905; assistant engineer on surveys, Ithaca-Dryden R. R., 1905; engineer in charge of sewer construction in Newton, N. J., 1906; engineer in charge of sewer construction, Ravena, Ohio, 1906; and since Oct. 1, 1906, engineer Simplex Foundation Company. Recommended by G. T. Sampson, L. L. Street, E. M. Blake and C. W. Sherman.

ELBERT EMERSON LOCHRIDGE, Springfield, Mass., (b. 1877). Beloit College (Wis.) S. B. 1898, University of Chicago, Bacteriological P. G. course, 1900, Mass. Inst. of Technology S. M. (course completed 1903), degree '05. Professional work on water supply under Prof. E. G. Smith, Beloit, Wis., 1899-1902, including work on filter-plants at Davenport, Ia.,

**Cedar Rapids, Ia., Binghamton, N. Y., Warren, Ohio, Brooklyn, N. Y. (two filters, 6 months, 1902), Kankakee, Ill.; typhoid studies, Ashland, Wis., Rock Island, Ill., etc., also work on other features at several other cities; 1903, resident engineer for S. M. Gray and G. W. Fuller at Springfield, Mass. (Ludlow Reservoir), on experimental filters; fall 1903 and spring, 1904, with Mo. and Chicago Drainage Canal suit in United States Supreme Court and from June, 1904, to present time, engineer, Springfield Water Department. Recommended by X. H. Goodnough, W. S. Johnson, A. T. Safford and R. A. Hale.**

**THOMAS MACKELLAR, Boston, (b. 1880). Four years in department of civil engineering at Cornell University, class of 1905. Assistant engineer, P. McK. and C. R. R., Cornwallville, Pa., summer of 1903; head draftsman, Simplex Concrete Piling Company, 1905; engineer Simplex Foundation Company, Philadelphia, from March 1, 1906, to May 1, 1906; and since May 1, 1906, manager, Boston office, Simplex Foundation Company. Recommended by G. T. Sampson, L. L. Street, E. M. Blake and C. W. Sherman.**

**LESLIE WALKER MILLAR, Newton, Mass., (b. 1879). Graduate of Mass. Inst. of Technology, 1902. Draftsman Associated Factory Mutual Fire Insurance Companies, 1902; Inspector of Building Construction, Boston Wharf Co., 1902-1904; with Charles G. Sherman, Consulting Engineer, Boston, 1904; and since 1904 Inspector Station Engineering Dept., Edison Electric Illuminating Co. of Boston. Recommended by R. E. Curtis, I. E. Moulthrop, C. H. Parker and L. S. Cowles.**

**THOMAS EDWARD PENARD, Everett, Mass., (b. 1878). Attended the schools in Dutch Guiana until 1890; came to the United States in 1890 and attended public schools of Everett, Mass., graduating from its High School in 1896. Graduated from Mass. Inst. of Technology, electrical engineering course, in 1900. Employed as draftsman with New England Structural Co. from Sept., 1900, to Nov., 1900; draftsman with Norcross Brothers, Worcester, from Nov., 1900, to Feb., 1901; with Edison Co., from Feb., 1901, to present time. In charge of Dept. of Mathematics, Boston Y. M. C. A. evening schools since 1905. Recommended by W. J. C. Semple, I. E. Moulthrop, Sidney Hosmer and R. E. Curtis.**

**JOHN JOSEPH ROURKE, Lynn, Mass. (b. 1874). Educated in public schools and graduate of Lynn Classical High School. Entered the employ of Boston and Maine R. R. in 1893, and has been since that time in Engineering Department of that road, except in 1902, when he was in Engineer's Department of N. Y. C. & H. R. R. R. Has been in charge of separation of grades work, railroad yards, bridges and buildings construction, dredging, wharves, etc. Is now an assistant engineer B. & M. R. R. Recommended by T. P. Perkins, J. P. Snow, W. H. Norris and F. B. Rowell.**

**JOHN ALVAH STARR, Watertown, Mass., (b. 1869). Graduated from University of Maine, 1896, civil engineering course. Employed by the Town of Watertown, Mass., as assistant engineer on sewer construction and street widening, July, 1896, to Sept., 1897; by the Metropolitan Park Commission as head of party and assistant engineer on survey and con-**

struction work, Sept., 1897, to Oct., 1902; by Arthur F. Gray, Mill Architect, Boston, as assistant engineer on survey for proposed manufacturing plant, Oct., 1902, to Jan., 1903; and by Coleman Brothers, Contractors, Boston, as civil engineer and superintendent, Jan., 1903, to present time. Recommended by H. A. Carson, L. B. Manley, L. L. Street and E. S. Davis.

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## MINUTES OF MEETINGS.

### NOVEMBER MEETING OF THE SOCIETY.

A regular meeting of the Boston Society of Civil Engineers was held at Chipman Hall, Tremont Temple, on Wednesday, November 21, 1906, at 8 o'clock P. M. President Frank W. Hodgdon in the chair; fifty-two members and visitors present.

The record of the last meeting was read and approved.

Messrs. Raymond C. Allen and George E. Harkness were elected members of the Society.

The President announced the death of Freeman C. Coffin, Senior Vice-President of the Society and Chairman of the Sanitary Section, which occurred November 11, 1906.

On motion of Mr. French the President was requested to appoint a committee to prepare a memoir. The President appointed the following members as that committee: Leonard Metcalf and William S. Johnson.

The Secretary read a letter from Dr. Clarence J. Blake presenting to the Society a set of 13 volumes of the Pacific Railway Surveys as a memorial of his father, John H. Blake, first Secretary of the Society.

On motion of Mr. Brooks the officers of the Society were directed to express to Dr. Blake the thanks of the Society and its appreciation of his valuable gift.

The President then introduced Mr. Frederic A. Kummer, Chief Engineer, United States Wood Preserving Co., who read a paper on "The Development of Wood Pavements." The paper was illustrated with lantern slides.

Mr. A. L. Plimpton, with the aid of a large diagram, explained the method used in laying the street railway track in Washington Street.

On motion of Mr. Manley the thanks of the Society were voted to Mr. Kummer and the company which he represented for the very interesting paper which he had just read, and for the



courtesies extended to the Society this afternoon on the occasion of the excursion to examine the wood pavement being laid on Washington Street.

### SANITARY SECTION MEETING.

A regular meeting of the Sanitary Section was held at the Copley Sq. Hotel, Wednesday evening, December 5, 1906; 38 members and guests present.

The following amendment to the By-Laws of the Section having been printed in a notice of the meeting was unanimously adopted:—

Add to Article IV the following new section:—

SECTION 5. Vacancies occurring in any office may be filled by ballot at the first meeting after notice of the same has been sent to each member, a majority of the votes cast being necessary to elect.

Messrs. L. M. Hastings, H. P. Eddy and L. D. Thorpe were appointed a committee to provide a suitable memorial to the late Chairman of the Section, Mr. Freeman C. Coffin.

It was voted that suitable resolutions be prepared by the Vice-Chairman and Clerk to be spread upon the records of the Section and to be sent to the family of Mr. Coffin.

Messrs. L. M. Hastings, J. C. Chase and W. W. Locke were appointed a committee to bring in to the next meeting a nomination for the office of chairman for the unexpired term.

The topic for discussion at the meeting — “The Maintenance of Sewage Filters in Winter” — was opened by G. E. Bolling of Brockton. The subject was discussed by Messrs. E. C. Frost of South Framingham, E. R. B. Allardice, J. L. Woodfall, H. P. Eddy, X. H. Goodnough and others.

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### APPLICATIONS FOR MEMBERSHIP.

The following applications for membership have been received, and are now before the Board of Government for approval. Members having information which will assist the government in its consideration of these applications are requested to communicate at once with any member of the Board. Communications will be regarded as confidential and for the use of the Board alone.

BENJAMIN FOX, Boston, (b. 1869). Educated at Lady Anne's London Architectural Association, and with John Slater, F. R. I. B. A., London,

England, 1886-88; with B. F. Dwight, Lockwood, Greene & Co., Winslow & Wetherell and Henry Vaughan, 1888-1895; since 1895, in business as architect and contractor. Recommended by E. S. Larned, E. A. Tucker, William Parker and S. E. Thompson.

GEORGE FRANKLIN HOOKER, Cambridge, (b. 1878). Attended public schools of Cambridge and took a three years' course at Rindge Manual Training School; in April, 1895, entered the employ of the city engineer of Cambridge as rodman, was advanced to transitman and later to head of a party; at present is employed as assistant in same office in charge of street work, which position he has held since December, 1901. Recommended by L. M. Hastings, F. H. Carter, F. A. Bayley and J. A. Holmes.

LEONARD CARY ROBINSON, Concord, Mass., (b. 1873). Educated in the public schools of Sumner, Me., and by private tutors. Commenced work in the office of Percy H. Richardson, C. E., Portland, Me.; from May, 1901 to April, 1904, assisted in Department of Public Works, Portland; from April, 1904, to Feb., 1906, assistant to Leonard Metcalf, C. E., during which time was employed on the re-construction of the water supply system of the Kennebec Water District, Waterville, Me., and since March, 1906, superintendent of Water and Sewer Departments, Concord, Mass. Recommended by G. N. Fernald, Leonard Metcalf, W. T. Barnes, C. W. Sherman and William Wheeler.

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## LIST OF MEMBERS.

### ADDITIONS.

RAYMOND C. ALLEN	. . . . .	Manchester, Mass.
GEORGE E. HARKNESS	. . . . .	185 Charles St., Boston.
JOHN S. RANKIN	. . . . .	Box 43, Merrimack, N. H.

### CHANGES OF ADDRESS.

WM. T. BARNES	. . . . .	566 Blue Hill Ave., Dorchester, Mass.
F. T. DANIELS	. . . . .	87 North St., Medford, Mass.
L. S. GRISWOLD	. . . . .	University of Missouri, Rolla, Mo.
HARRY L. KIMBALL	. . . . .	856 Watertown St., West Newton, Mass.
ALEX. P. MILNE	. . . . .	4 State St., Boston.
OTTO SONNE	. . . . .	132 Nassau St., New York, N. Y.
ERNEST W. WIGGIN, Engineer, Bridges and Buildings, Missouri Pacific Railway	. . . . .	St. Louis, Mo.

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## LIBRARY NOTES.

### RECENT ADDITIONS TO THE LIBRARY.

Joliet, Ill., Report of Board of Consulting Engineers on Sanitary Dist. Improvements, 1906.

Louisville, Ky., Report of Commissioners of Sewerage, 1906.

Milwaukee, Wis., Annual Report of Board of Public Works, 1905.

Indiana, Annual Report, State Board of Health, 1905.

On the Safeguarding of Life in Theatres, by J. R. Freeman.

United States, Report of Superintendent, Coast and Geodetic Survey, 1906.

GIFT OF GEORGE A. KIMBALL, C. E.

California, Message and Correspondence relating to, transmitted to Congress by the President, 1850.

Massachusetts, Annual Report of Railroad Corporations for 1855.

Michigan, Report of Commissioners of Railroads for 1885.

Michigan, Report of Commissioners of Railroads for 1886.

GIFT OF CLEMENS HERSCHEL, C. E.

Reminiscences of an Octogenarian of the City of New York, (1816 to 1860), by Chas. H. Haswell.

## NEW ENGINEERING WORK.

(Under this head the Excursion Committee proposes to present each month a brief resume of engineering work in progress in New England, as far as such information is readily obtainable. The assistance of members is desired, and items of interest will be gladly received. Such items are intended to include not only works of exceptional magnitude or containing novel features, but also engineering construction work of all kinds and all degrees of magnitude. Notes should be in the hands of the Committee not later than the 2nd Wednesday of each month. The thanks of the Committee are due to the members who have furnished data for the Bulletin.—E. M. BLAKE, Secretary, Excursion Committee, 8 Beacon St., Boston.)

**Commonwealth of Massachusetts.—METROPOLITAN WATER AND SEWERAGE BOARD, WATER WORKS.**—The building of 4 uncovered gravel filter-beds, having a total area of about 2 acres, located in the town of Sterling on the Wachusett watershed, is nearly completed.

Work has been recently finished on about 4 miles of open ditches with plank bottom and paved slopes in swamps in Sterling.

Work is in progress for a brick pumping station near the Brattle Station in Arlington.

**METROPOLITAN PARK COMMISSION.**— *Charles River Reservation.*— Building to sub-grade roadway through United States Arsenal Grounds, Arsenal St. to North Beacon St., and building masonry river wall.

*Furnace Brook Parkway.*— Surfacing and finishing Furnace Brook Parkway from Adams St. to Blue Hills Reservation.

*Lynn Fells Parkway.*— Building to sub-grade Parkway from Middlesex Fells Reservation to Green St., Melrose.

*Mystic River Reservation.*— Reinforced concrete masonry bridge over Mystic River, near Armory, Medford.

Reinforced concrete masonry bridge over Mystic River at Auburn St., Medford.

*Quincy Shore Reservation.*— Building to sub-grade Quincy Shore Reservation from Atlantic St. to National Sailors' Home.

**HIGHWAY COMMISSION.**— State highway work is in progress at present in the following municipalities :

Burlington,	Canton,	Chicopee,
Dighton,	Falmouth,	Holliston,
Huntington,	Lee,	Mansfield,
Rehoboth,	Scituate,	Stockbridge.
Westborough,	Haverhill (Bridge),	

**HARBOR AND LAND COMMISSIONERS.**— *Menamsha Inlet.*— Dredging channel and riprapping banks with stone.

*Ipswich River.*— Dredging channel.

*Cuttyhunk.*— Building stone jetties.

*Annisquam River.*— Dredging channel.

*Scituate.*— Riprapping shore at south end of Third cliff.

The contractor for sea walls at North Scituate, during the winter, is quarrying the stone for the granite wall at Beach St. from a quarry near by.

It is expected that the dredging of a channel and anchorage basin at Cottage Park and the dredging of an extension to the anchorage basin between Savin Hill and Commercial Wharf, Dorchester, will be commenced next week.

**CHARLES RIVER BASIN COMMISSION.**— During the past month some concrete has been put in place, but, owing to the cold weather, the amount has been small and this work has now entirely stopped. There will probably be little more concreting done before spring. Some dredging has also been done in connection with the Embankment.

**City of Boston.**— **ENGINEERING DEPARTMENT.**— *Atlantic*



*Ave. Bridge* over the Yard of the Boston Terminal Company and Fort Point Channel.—The erection of the steel superstructure of the draw span is in progress. The structure is to be a deck swing draw with rim-bearing turntable. It is to be 183 feet 10½ inches long, measured on centre line, by 49 feet 2 inches wide; and it is to have one sidewalk 9 feet 7 inches in width and one roadway 38 feet wide in the clear between curbs. One end of the draw is to be built on a skew, the other to a circular curve, and the street surface is to be inclined at 4½ per cent gradient. The draw is to have two main riveted trusses spaced 36 feet apart on centres and connected to two cross girders, which latter distribute the load upon the turntable at four points. The turntable is 29 feet 10½ inches in diameter; and the drum, which is 4 feet deep, is carried by 40 steel wheels 2 feet in diameter. Floor beams and stringers are steel and the floor surfacing is to be wood. The draw superstructure, when completed, will weigh approximately 500 tons, of which about 370 tons will be metal work. The draw span is to be operated by electricity.

**Boston Transit Commission.**—Work is progressing on the Washington-St. Tunnel from State St. to the Relief Station in Haymarket Sq.

**Boston Elevated Railway.**—ELEVATED CONSTRUCTION.—*Sullivan Sq. car yard.*—The reinforced concrete floor is completed, 4 of the storage tracks with special work are also finished, and the timber stringers are being laid for the remaining 4 tracks.

Changes are being made in the location of posts supporting the loop at Sullivan Sq. to afford more storage room for surface cars under the new elevated yard. Six of the present posts are to be altered and placed on new foundations, the structure at present being supported on wooden shores.

*Forest Hills Extension.*—The steel structure is erected as far as Lotus Pl., or about to the Forest Hills car barn.

Track work is under way and is partially completed to Dimock St.

**SURFACE LINES.**—Changes to the easterly incline at Dudley St. are under way to provide the necessary room for operating the large semi-convertible cars.

*Milton Car Barn.*—The construction of the new extension of the Milton Car Barn of the Boston Elevated Railway will require the casting and sinking of 413 concrete piles from 10 to 35 feet long. The work of casting piles is already under way and driving will

begin as soon as piles are sufficiently set. The piles are square in section 13" x 13" reinforced with No. 3 Clinton wire fabric. They will be sunk to ledge by means of a water jet and are required to sustain a load of 30 tons each.

The Charles R. Gow Company are contractors for the piling and concrete work.

**Boston & Albany Railroad.**—**ABOLITION OF GRADE CROSSINGS.**—*East Boston Grade Crossing.*—2,300 cubic yards of concrete are being placed in the abutments for the Saratoga St. Bridge. Steel bridges are being built at Maverick, Prescott and Porter Sts. The rock ballast is being placed for the main tracks.

*Newton Centre Grade Crossing.*—Two steam shovels are at work excavating for the north track. The front wall of the stone passenger station is being supported and will be underpinned with ashlar faced masonry. The last section of the concrete wall masonry is being laid, the reinforced concrete coal trestle is finished and timber track stringers are being laid.

*Adams, Mass.*—At the Maple Grove Station the grading for the roadway and loaming the slopes is nearly finished and the curbing is being laid and the gravel ballast placed.

*Brookline.*—At the Beaconsfield Station a reinforced concrete platform is being built, using Clinton Welded Metal.

*Kneeland St. Warehouse.*—A gravel roofing is being laid, and reinforced concrete walls for elevator as well as reinforced concrete stairways are being built. Lime wash paint is being used which is worthy of note.

*Clyde St. Pier, East Boston.*—The parapet stones are being laid on the sea wall at the head of the dock. Pile driving is going on, 900 out of 3,800 piles having been driven. The stone piers are being built for a part of the structure.

**Boston & Maine Railroad.**—*Ipswich.*—The grade crossing at High St. is being abolished, and a new highway bridge built to carry the Boston & Northern Railway Company's cars over the railroad.

*Newburyport.*—The short tunnel at High St. is being changed to an open cut and new highway bridge constructed.

**New York, New Haven & Hartford Railroad.**—The masonry foundations for the 4-track drawbridge at Neponset have been completed. These foundations consist of 6 stone masonry piers and one abutment resting on piles. Upon this masonry is

to rest a steel girder bridge of 5 fixed spans and 1 rolling lift draw span. The fixed spans are all erected in place and the rolling lift span is in process of erection. The draw has an opening of 50 feet and is to be operated with 2 gasolene engines. To the south of this steel bridge is to be a 4-track pile trestle about 450 feet long. This trestle is nearly complete for 2 tracks.

No visible work has yet been done on the proposed new draw-bridge at Somerset, Mass., over the Taunton River, but the contract for the substructure and for the pile trestle has been awarded and the necessary material is being assembled.

At the Boston Freight Terminal a coal handling plant and pocket of 13,000 tons capacity is now under construction. This requires the dredging of the dock to a depth of 32 feet below low water, the construction of a wharf 500 feet long with unloading trestle upon it supporting 2 coal unloading towers, a steel bridge 160 feet long extending from the unloading trestle to the pocket, and a coal pocket 40 by 380 feet with the necessary machinery, coal cars, etc., for economically and quickly unloading and storing the coal and delivering it to locomotives and cars. The dredging has been done, the wharf is about one-half built, and the foundations for the pocket are about one-half completed.

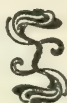
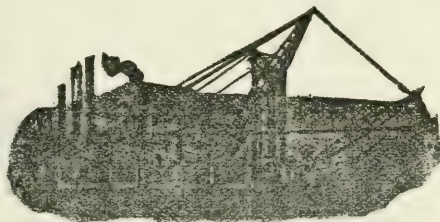
**Cambridge, Mass.** — WATER DEPARTMENT. — *Tunnel under Broad Canal.* — Located on First and Sixth Sts., Cambridge, passing under Broad Canal. To be of brick masonry 6 feet in diameter at First and Sixth Sts., and 6 feet 6 inches at Third St. Are to carry water pipe (together with gas pipe at Third St.) under canal, replacing present pipes crossing on bed of canal, and are made necessary on account of dredging operations of Charles River Basin Commission for deepening the canal in connection with basin project.

Shafts will be from 45 to 50 feet deep and top of tunnel arch from 25 to 34 feet below high water. Work will be done by pneumatic process and will begin at Third St., where the contractor is now assembling his plant and expects to commence operations about December 10th.

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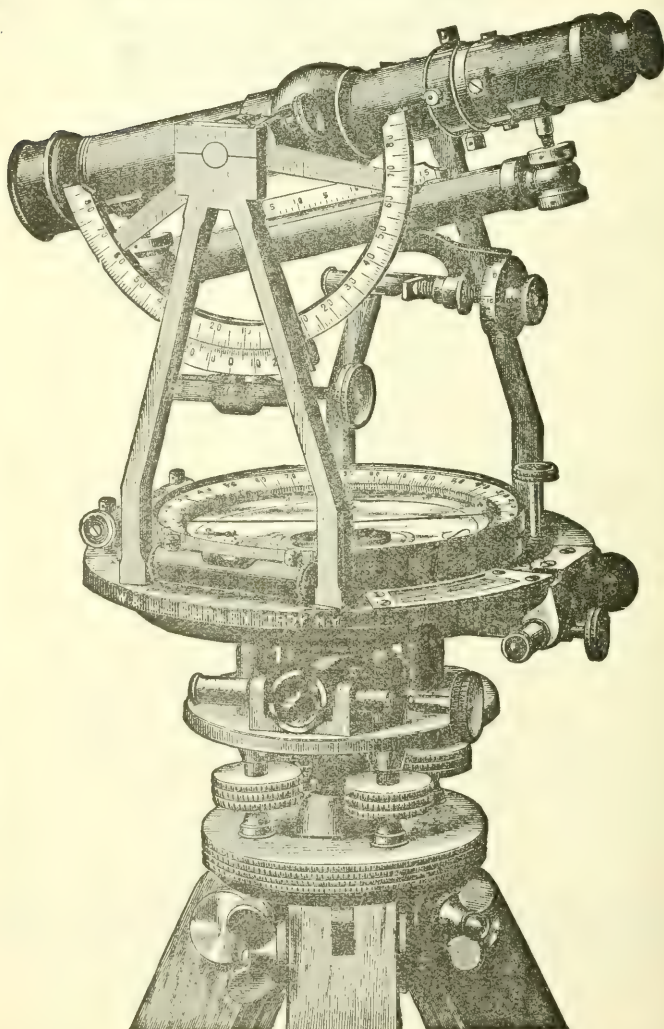
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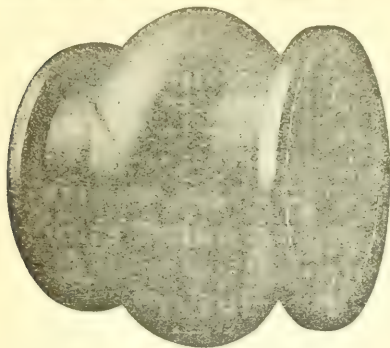
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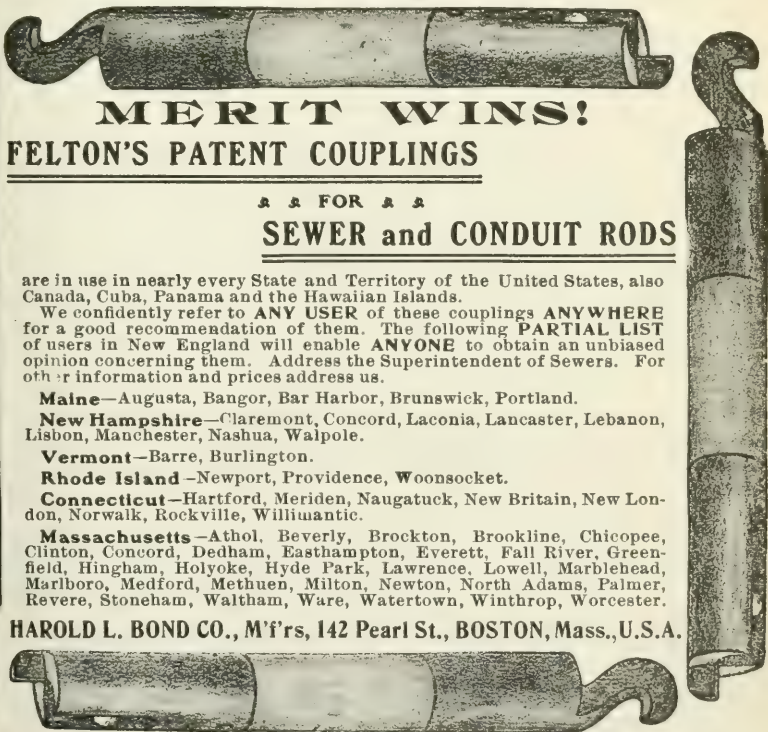
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# MONTHLY BULLETIN.

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NEW SERIES.

JANUARY, 1907.

No. 8.

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## REGULAR MEETING.

A regular meeting of the Boston Society of Civil Engineers will be held on Wednesday, January 23, 1907, at 7.30 o'clock P. M., in

CHIPMAN HALL, TREMONT TEMPLE, BOSTON.

A paper entitled "Replacement of Bridges and Allied Structures" by Mr. Herman K. Higgins will be read.

It is expected that Messrs. G. F. Swain, J. P. Snow, J. R. Worcester, F. P. McKibben and others will take part in the discussion of this paper.

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**BUSINESS OF THE MEETING:** To ballot on the applications for membership as announced in this notice.

To choose a Committee of five to nominate officers for the ensuing year.

S. E. TINKHAM, *Secretary.*



## CANDIDATES FOR MEMBERSHIP.

To be balloted on at meeting January 23, 1907.

**BENJAMIN FOX**, Boston, (b. 1869). Educated at Lady Anne's London Architectural Association, and with John Slater, F. R. I. B. A., London, England, 1886-88; with B. F. Dwight; Lockwood, Greene & Co.; Winslow & Wetherell and Henry Vaughan, 1888-1895; since 1895, in business as architect and contractor. Recommended by E. S. Larned, E. A. Tucker, William Parker and S. E. Thompson.

**GEORGE FRANKLIN HOOKER**, Cambridge, (b. 1878). Attended public schools of Cambridge and took a three years' course at Rindge Manual Training School; in April, 1895, entered the employ of the City Engineer of Cambridge as rodman, was advanced to transitman and later to head of a party; at present is employed as assistant in same office in charge of street work, which position he has held since December, 1901. Recommended by L. M. Hastings, F. H. Carter, F. A. Bayley and J. A. Holmes.

**LEONARD CARY ROBINSON**, Concord, Mass., (b. 1873). Educated in the public schools of Sumner, Me., and by private tutors. Commenced work in the office of Percy H. Richardson, C. E., Portland, Me.; from May, 1901 to April, 1904, assisted in Department of Public Works, Portland; from April, 1904, to Feb., 1906, assistant to Leonard Metcalf, C. E., during which time was employed on the re-construction of the water supply system of the Kennebec Water District, Waterville, Me., and since March, 1906, superintendent of Water and Sewer Departments, Concord, Mass. Recommended by G. N. Fernald, Leonard Metcalf, W. T. Barnes, C. W. Sherman and William Wheeler.

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## APPLICATIONS FOR MEMBERSHIP.

The following applications for membership have been received and are now before the Board of Government for approval. Members having information which will assist the government in its consideration of these applications are requested to communicate at once with any member of the Board. Communications will be regarded as confidential and for the use of the Board alone.

### AS MEMBERS.

**THEODORE WHITE NORCROSS**, Medford, Mass., (b. 1883). Graduated, 1904, from the Tufts College Engineering School: employed in summer of 1902 as rodman by the Metropolitan Water Board: in summer of 1903 as inspector and timekeeper on sewer and culvert construction by the City

of Medford; entered the employment of the U. S. Geological Survey in Sept., 1904, and is now engaged in hydrographic work in New England. Recommended by H. K. Barrows, F. B. Sanborn, C. D. Bray and C. B. Breed.

ROBERT LELAND READ, Malden, Mass., (b. 1841). B. S., Dartmouth College, 1864; member, American Society Civil Engineers since 1874. From 1865 to 1901 engaged in civil engineering in Ohio, Indiana and Illinois, mostly on railroad construction. During the above time he was engineer of the following railroads: Indianapolis, Cincinnati & Lafayette, White Water Valley, Indianapolis & St. Louis, Indianapolis Belt Line, Central Union Depot & Railway of Cincinnati, and of terminal construction on the Cleveland, Cincinnati, Chicago & St. Louis; at present not in active practice. Recommended by Desmond Fitzgerald, J. P. Snow, Fred. Brooks and C. F. Morse.

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## LIBRARY NOTES.

### RECENT ADDITIONS TO THE LIBRARY.

Engineering Index, Vol. 4, for five years, 1901-1905.

Institution of Mechanical Engineers (London), Proceedings, 1906; Parts 1 and 2.

Westinghouse Companies' Exhibit at International Ry. Congress, Washington, 1905.

Providence, R. I., Annual Report of City Engineers for 1905.

Rochester, N. Y., Annual Report Dept. Public Works, 1905.

Connecticut, Annual Report Railroad Commissioners for 1906.

Maine, Annual Report, State Board of Health for 1904-1905.

Massachusetts, Annual Report Harbor and Land Commissioners for 1906.

United States, Report of Librarian of Congress, 1905-1906.

Building and Engineering Trades' Reference Book of Massachusetts and Rhode Island for 1906-1907.

## MINUTES OF MEETING.

### DECEMBER MEETING OF THE SOCIETY.

A regular meeting of the Society was held at Chipman Hall, Tremont Temple, on Wednesday, December 19, 1906, at 7.55 o'clock P. M. President F. W. Hodgdon in the chair; sixty-nine members and visitors present.

The record of the last meeting was read and approved.

Messrs. John K. Barker, Edward Burr, Wilbur W. Davis, Burton I. Drisko, Harry W. Fitts, Edward Holmes, Elbert E. Lochridge, Thomas MacKellar, Leshe W. Millar, Thomas E. Penard, John J. Rourke and John A. Starr were elected members of the Society.

Mr. Leonard Metcalf, for the Committee appointed to prepare a memoir of Freeman C. Coffin, a Vice-President of the Society, presented and read its report.

On motion of Mr. W. S. Johnson it was voted to postpone indefinitely the election of a Vice-President to fill the vacancy caused by the death of Freeman C. Coffin.

The President brought to the attention of members the desirability of addressing an appeal to the Massachusetts delegation in the National House of Representatives, urging them to petition the Speaker, without delay, that the bill now pending which provides for the establishment of the Southern Appalachian and White Mountain Forest Reserves, may be taken up for final action and passed at an early day in the present session. After a short discussion it was voted to refer the matter to the Board of Government, with the suggestion that a delegation be selected to write to the members of Congress from this State urging the early consideration of the bill.

Mr. Paul Winsor, Chief Engineer of Motive Power and Rolling Stock, Boston Elevated Railway Co., was then introduced and gave a very interesting talk on "Gas Engines and Producer Plants, as Used by the Boston Elevated Railway Co."

A discussion followed, which was participated in by Mr. E. L. Clark, of the Westinghouse Machine Co., Mr. H. W. True, of the Barbour-Stockwell Co., Mr. J. C. Riley, of the Massachusetts Institute of Technology, and others.

After passing a vote of thanks to Mr. Winsor for his interesting talk, the Society adjourned.

## LIST OF MEMBERS.

## ADDITIONS.

JOHN K. BARKER	332 Main St., Springfield Mass.
EDWARD BURR, Maj., Corps of Engrs., U.S.A.,	25 Pemberton Sq., Boston.
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HARRY W. FITTS	332 No. Harvard St., Allston, Mass.
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ELBERT E. LOCHRIDGE	43 Bridge St., Springfield, Mass.
THOMAS MACKELLAR	519 Tremont Bldg., Boston.
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## NEW ENGINEERING WORK.

(Under this head the Excursion Committee proposes to present each month a brief resume of engineering work in progress in New England, as far as such information is readily obtainable. The assistance of members is desired, and items of interest will be gladly received. Such items are intended to include not only works of exceptional magnitude or containing novel features, but also engineering construction work of all kinds and all degrees of magnitude. Notes should be in the hands of the Committee not later than the 2nd Wednesday of each month. The thanks of the Committee are due to the members who have furnished data for the Bulletin.—E. M. BLAKE, Secretary, Excursion Committee, 8 Beacon St., Boston.)

**United States Government.**—STATEMENT OF WORK ACCOMPLISHED DURING THE YEAR 1906 ON RIVER AND HARBOR IMPROVEMENT IN MASSACHUSETTS UNDER THE DIRECTION OF THE UNITED STATES ENGINEER OFFICE.—*Newburyport Harbor.*—2026 tons of rubblestone were deposited in the north jetty, re-top-ping about 200 linear feet of its outer end.

*Merrimack River.*—20,166 cubic yards of material were dredged from the river under the project to obtain a channel 150 feet wide and 7 feet deep at mean low water from the sea to Haverhill, Mass.

*Breakwater at Sandy Bay, Mass.*—19,087 tons of rubblestone were deposited in the substructure of the breakwater.

*Salem Harbor.*—A channel 10 feet deep at mean low water and varying in width from 300 feet to 200 feet was obtained from the southerly end of the harbor to Derby Wharf Light by dredging 37,823 cubic yards of material.

*Lynn Harbor.*—220,540 cubic yards of material were dredged under the project to obtain a channel 200 feet wide and 15 feet deep at mean low water from the sea to the turning basin at the wharves of Lynn.

*Mystic River.*—A channel 4 feet deep at mean low water and of widths varying between 70 feet and 50 feet was completed to Medford, Mass.; 28,765 cubic yards of material were dredged during the year.

From the lower Mystic River below the mouth of Island End River 15,111 cubic yards of material were dredged in prosecution of a project to obtain a channel 25 feet deep at mean low water and 300 feet wide to that depth in Boston Harbor.

*Malden River.*—27,380 cubic yards of material were dredged from this river to restore to a depth of 12 feet at mean high water the channel previously dredged from Mystic River to the Medford St. Bridge.

*Chelsea Creek, Boston Harbor.*—156,012 cubic yards of material were dredged under the project to obtain a channel 18 feet deep at mean high water and 150 feet wide up to the head of navigation at the Boston & Maine R. R. Bridge at Revere.

*Boston Harbor.*—Contracts were completed for removing 24 ledges containing 19,231 cubic yards from the lower main ship channel and 11 ledges containing 2,066 cubic yards from the upper main ship channel, all to a depth of 27 feet below mean low water; good progress was also made under a contract to remove to a depth of 35 feet at mean low water ledges in the upper harbor aggregating 16,555 cubic yards. Under the project to obtain a channel 35 feet deep at mean low water, 1,200 feet wide in the upper harbor and 1,500 feet wide in Broad Sound; 2,379,785 cubic yards of material were dredged during the year.

*Weymouth Fore River.*—94,029 cubic yards of material were dredged under a project to obtain a channel 18 feet deep at mean low water and 300 feet wide up to the Quincy Bridge.

*Town River.*—21,249 cubic yards of material were dredged from this river and a channel was completed 4 feet deep at mean low water and 100 feet wide to the upper wharves at Quincy.

**Commonwealth of Massachusetts.**—WORK DONE AND IN PROGRESS UNDER THE DIRECTION OF THE HARBOR AND LAND COMMISSION IN 1906.—*Boston Harbor.*—The wide anchorage basin at City Point was completed and a channel dredged to the wharves on the northerly side of Commercial Point, Dorchester. In addition, a small amount of dredging was done on Section 1 of the Anchorage Basin at Bird Island Flats.

*Annisquam River.*—A channel is being dredged 50 feet wide and 6 feet deep at mean low water.

*Harwichport.*—A stone jetty is being built at the entrance to Witchmere Harbor. Work is suspended for the winter, but the jetty will be finished in the spring.

*Harwich and Osterville.*—At the mouth of Herring River and at East Bay, the beaches have been protected by stone riprap.

*Vineyard Haven.*—A stone breakwater between 500 and 600 feet long has been built.

*South Dartmouth.*—The breakwater at Apponagansett Harbor has been extended 135 feet.

*Dartmouth.*—At the mouth of Paskamanset River a channel 150 feet wide and 5 feet deep has been dredged through the bar.

*Ipswich.*—Contract has been let for dredging in Ipswich River and it is expected that work will be commenced very shortly.

*Winthrop.*—Contract has been let for dredging at Cottage Park and work will begin soon.

*Connecticut River.*—The riprap protection to the banks at Hadley has been strengthened and at Agawam riprap has been extended about 400 feet along the river bank.

*Seituate.*—Contracts have been let for building three sections of sea wall along the beach, but work has been suspended for the winter. Another contract for protecting a section of the beach at the Third Cliff with stone riprap is now in progress.

*Cuttyhunk.*—Work is still in progress on the stone jetties to protect the entrance to the harbor, and at Menamsha Inlet, between the towns of Gay Head and Chilmark, work is in progress dredging the channel and protecting its banks with stone riprap.

Field work has been suspended for the winter on the survey for the locating of town boundaries.

The survey for re-locating the boundary line between Massachusetts and Connecticut, which has been in progress throughout the season, has been completed, and the monuments for re-marking the line will be set next spring.

Fifteen new bounds have been set during the year at different points along the boundary line between Massachusetts and Rhode Island.

On the boundary between Massachusetts and New York three bounds, which had become loosened, have been re-set in concrete and two, in a similar condition on the boundary between Massachusetts and Vermont, have been re-set in concrete.

**METROPOTITAN PARK COMMISSION.**—Nearly all construction work under the direction of this department which has been in progress within the past year has been completed, except such portions of the finishing as it will be necessary to postpone until Spring.

The work on the reinforced concrete bridges over the Mystic River at Auburn St. and near the Armory, Medford, is still in progress; the work now being done is that of dressing the faces of the concrete masonry. The treatment specified for the exposed surfaces of these bridges is as follows:—For the faces of abutments and soffits of the arches a facing one inch in thickness, composed of one part Portland cement and one part sand, is used, and after the forms have been removed these surfaces are rubbed with grindstone until the form marks are removed and the surfaces are smooth and even; for the faces of the spandrel and wing walls a facing one and one-half inch in thickness, composed of one part Portland cement, one part sand and two parts bank gravel screenings, is used, and after the forms are removed the surfaces are picked or pointed to remove the thin mortar surface and produce a rough effect. For all trimmings, such as the arch rings, quoins and copings, molded concrete blocks, with facing composed of one part Portland cement and three parts crushed stone screenings, are used. The surfaces of these molded blocks are bush-hammered.

**City of Boston.**—SEWER DEPARTMENT.—*On Stony Brook at Jamaica Plain.*—Three sections under way, of steel concrete conduit, 20 feet x 16 feet.

Section one has been in quicksand — just running out.

Section 4, Crossing of Washington St.—Travel had to be diverted by temporary roadway and bridge through private land at one side.

*Roslindale Brook Conduit, Linden St., Roslindale.*—8-ft. circular concrete conduit, invert lined with brick.

**Boston Transit Commission.**—Work is progressing on the Washington-St. Tunnel from State St. to the Relief Station in Haymarket Sq., and on the Franklin-St. and Essex-St. Stations.

**Boston Elevated Railway.**—ELEVATED CONSTRUCTION.—*Sullivan Sq. Car Yard.*—Temporary special work is under construction to provide access to storage tracks during erection of additional steel structure connecting the yard with the present loop.

Changes are being made in the location of posts supporting the loop at Sullivan Sq. to afford more storage room for surface cars under the new elevated yard. Six of the present posts are to be altered and placed on new foundations, the structure at present being supported on wooden shores.



*Forest Hills Extension.*—The steel structure is erected as far as the Metropolitan Coal Company's property, or about to Arborway at Forest Hills.

Track work is under way and is partially completed to Dimock St.

*SURFACE LINES.*—Temporary tracks have been put in at the Dudley St. crossing of the New York, New Haven & Hartford Railroad for use during construction of bridge abutments and the completion of grade changes in Dudley St.

Bridges over Boston & Albany Railroad at Massachusetts Ave. and Columbus Ave. are being strengthened to carry heavy cars.

At the Sullivan Sq. shops 55 cars of the semi-convertible type are being equipped for operation.

**New York, New Haven & Hartford R. R.**—The masonry foundations for the 4-track drawbridge at Neponset have been completed. These foundations consist of six stone masonry piers and one abutment resting on piles. Upon this masonry is to rest a steel girder of five fixed spans and one rolling lift draw span. The fixed spans are all erected in place and the rolling lift span is in process of erection. The draw has an opening of 50 feet and is to be operated with two gasoline engines. To the south of this steel bridge is to be a 4-track pile trestle about 450 feet long. This trestle is complete for two tracks,

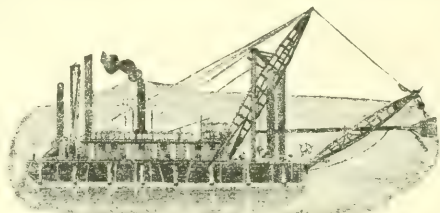
No visible work has yet been done on the proposed new drawbridge at Somerset, Mass., over the Taunton River, but the contract for the substructure and for the pile trestle has been awarded and the necessary material is being assembled.

At the Boston Freight Terminal a coal handling plant and pocket of 13,000 tons capacity is now under construction. This requires the dredging of the dock to a depth of 32 feet below low water, the construction of a wharf 500 feet long with unloading trestle upon it supporting two coal unloading towers, a steel bridge 160 feet long extending from the unloading trestle to the pocket, and a coal pocket 40 feet x 380 feet with the necessary machinery, coal cars, etc., for economically and quickly unloading and storing the coal and delivering it to locomotives and cars. The dredging has been done, the wharf is about one-half built and the foundations for the pocket are nearly completed.



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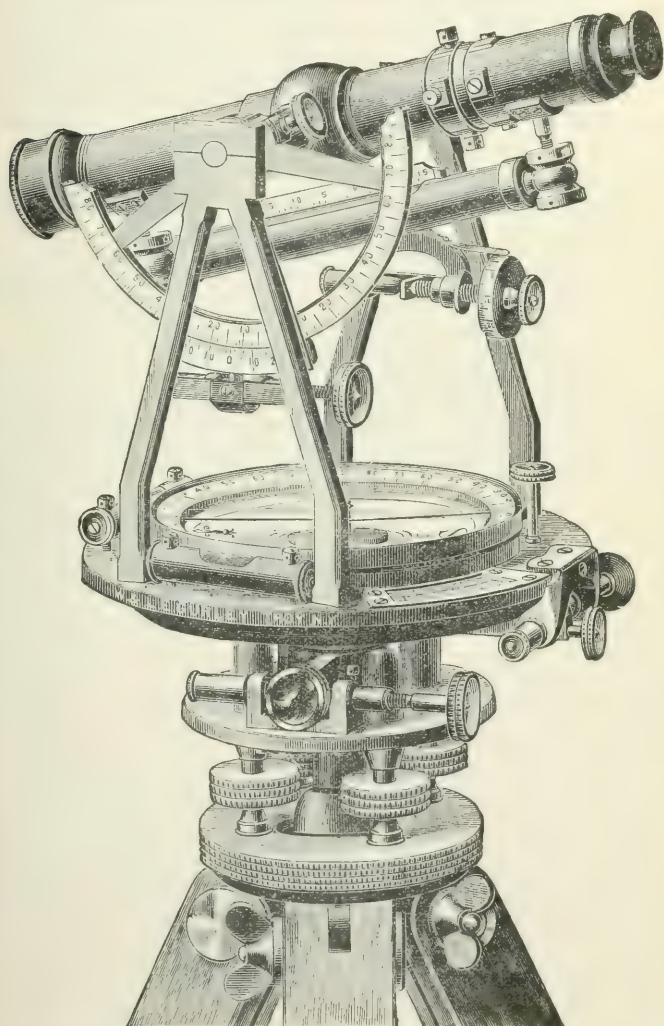
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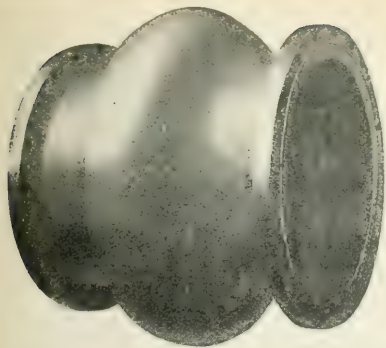
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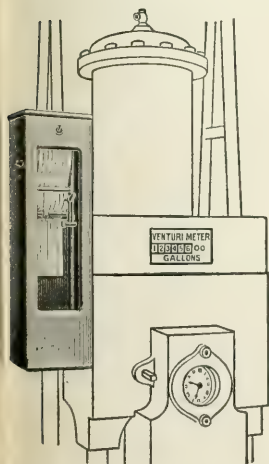
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# **BOSTON SOCIETY OF CIVIL ENGINEERS.**

**ORGANIZED JULY 3, 1848.**

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## **MONTHLY BULLETIN.**

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NEW SERIES.

FEBRUARY, 1907.

No. 9.

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### **REGULAR MEETING.**

A regular meeting of the Boston Society of Civil Engineers will be held on Wednesday, February 20, 1907, at 7.30 o'clock P. M., in

CHIPMAN HALL, TREMONT TEMPLE, BOSTON.

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The subject for discussion at this meeting will be Engineers' Specifications from the Contractor's Point of View, and will be opened by Mr. James W. Rollins, Jr.

A number of members have signified their intention to be present and take part in the discussion so that a very interesting meeting is assured.

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**BUSINESS OF THE MEETING:** To ballot on the applications for membership as announced in this notice.

S. E. TINKHAM, *Secretary.*

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### **EXCURSION.**

There will be an Excursion on Wednesday, February 20, 1907, to the pipe subway under Broad Canal at First St., Cambridge, constructed by the Cambridge Water Department. Members will meet at 2 P. M. at First St. and Broad Canal. Take any West Boston car. Members will be taken through in small parties and suits will be provided by the contractor. Arrangements will also be made to visit a similar completed tunnel under Broad Canal at Third St. See description under Bulletin.

EXCURSION COMMITTEE.



## ANNUAL DINNER.

Arrangements are being made for the 25th Annual Dinner, to take place at Hotel Vendome, Boston, Tuesday evening, March 12, 1907. A circular giving full information will be sent later.

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## BINDING THE JOURNALS.

Members who wish the Secretary to attend to the binding of their numbers of the *Journal* are requested to send them to Room 715, Tremont Temple, Boston, before MARCH 20.

Arrangements have been made by which members can have the *two* volumes bound in *one* for 70 cents, or each volume bound separately for 40 cents each; the style of binding to be the same and uniform with that of former years. Mark clearly which way it is desired the binding shall be done.

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## MEMBERSHIP CARDS.

The membership cards for 1907 are now ready for distribution and one will be mailed to any member who applies to the Secretary for it.

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## CANDIDATES FOR MEMBERSHIP.

To be balloted on at meeting February 20, 1907.

**THEODORE WHITE NORCROSS**, Medford, Mass., (b. 1883). Graduated. 1904, from the Tufts College Engineering School; employed in summer of 1902 as rodman by the Metropolitan Water Board; in summer of 1903 as inspector and timekeeper on sewer and culvert construction by the City of Medford; entered the employment of the U. S. Geological Survey in Sept., 1904, and is now engaged in hydrographic work in New England. Recommended by H. K. Barrows, F. B. Sanborn, C. D. Bray and C. B. Breed.

**ROBERT LELAND READ**, Malden, Mass., (b. 1841). B. S., Dartmouth College, 1864; member, American Society Civil Engineers since 1874. From 1865 to 1901 engaged in civil engineering in Ohio, Indiana and Illinois, mostly on railroad construction. During the above time he was engineer of the following railroads: Indianapolis, Cincinnati & Lafayette, White Water Valley, Indianapolis & St. Louis, Indianapolis Belt Line, Central Union Depot & Railway of Cincinnati, and of terminal construction on the Cleveland, Cincinnati, Chicago & St. Louis; at present not in active practice. Recommended by Desmond Fitzgerald, J. P. Snow, Fred. Brooks and C. F. Morse.

## APPLICATIONS FOR MEMBERSHIP.

The following applications for membership have been received and are now before the Board of Government for approval. Members having information which will assist the government in its consideration of these applications are requested to communicate at once with any member of the Board. Communications will be regarded as confidential and for the use of the Board alone.

### AS MEMBERS.

EDWARD HUTCHINS, East Walpole, Mass., (b. 1877). Graduate of Worcester Polytechnic Institute, 1903. From October, 1900, to June, 1902, was with A. P. Rice, Worcester, partly on construction work and partly drafting. In June, 1903, started drafting for Lombard Improved Water Wheel Governor Co. and stayed with them till September, 1903, then went to work for H. S. Ferguson, C. E., Millinocket, Me.; June, 1906, left the employ of Mr. Ferguson and at present is engineer for F. W. Bird & Son, East Walpole. Recommended by L. P. Kinnicutt, H. K. Barrows, J. W. Tower and H. S. Ferguson.

CHARLES F. KNOWLTON, Marlborough, Mass., (b. 1865). With Norman & Weaver, water works construction, 1883-84; travelling 1885-89; in city engineer's office, Duluth, Minn., 1889-90; assistant engineer with Everett Land Co., Everett, Wash., 1891-95; resident engineer, Mass. Highway Commission, 1895 and 1899; commissioner of public works, Quincy, Mass., 1896-98 and 1900-04; superintendent for Contractor, E. W. Everson & Co., 1905; city engineer and superintendent of streets for City of Marlborough, 1906; and at present manager of Hassam Paving Dept. for Simpson Bros. Corporation, Boston. Recommended by F. E. Tupper, F. H. Fay, Perry Lawton and W. S. McKenzie.

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## MINUTES OF MEETING.

### JANUARY MEETING OF THE SOCIETY.

A regular meeting of the Boston Society of Civil Engineers was held at Chipman Hall, Tremont Temple, on Wednesday, January 23, 1907, at 8 o'clock P. M. President F. W. Hodgdon in the chair; fifty-eight members and visitors present.

The record of the last meeting was read and approved.

Messrs. Benjamin Fox, George F. Hooker and Leonard C. Robinson were elected members of the Society.

On motion duly seconded, the President was requested to appoint a committee of three to report to the meeting the names of five members to serve as a committee to nominate officers for the ensuing year. The President appointed as this committee Messrs. C. F. Allen, H. B. Wood and N. S. Brock. Later in the evening this committee reported the following names as members of the nominating committee and they were unanimously elected : Messrs. Frederick Brooks, Ira N. Hollis, George A. Carpenter, Frederick H. Fay and Charles B. Breed.

On motion of Mr. Adams the usual committee (Mr. Henry Manley) was appointed to make arrangements for the annual dinner.

Prof. Dwight Porter offered the following resolution, and it was unanimously adopted :

It having come to the attention of the Boston Society of Civil Engineers that during the last session of Congress a reduction of \$50,000 was made in the appropriation in the Sundry Civil Bill for the work of the United States Geological Survey in gaging the streams and otherwise investigating the water resources of the United States, the Society views with apprehension this reduction in the appropriation for a work which it believes to be of great importance in the material development of the country.

Realizing that it is impracticable, under state or private organization alone, to carry on work of the scope that is necessary, it believes it to be for the best interest of all that the investigations should be made under national supervision.

The water resources of New England are of the utmost importance to her industrial welfare, and the present reduction in the appropriation for measuring those resources is believed to threaten the continuity of records upon which the economic development of the streams must depend.

It is, therefore, the sense of the Society that immediate restoration of the appropriation should be made to its recent amount, and that consideration should be given by Congress to the necessity of increasing the amount still farther in the near future; and it is hereby resolved that the Board of Government of the Society be directed to forward copies of this resolution to each member of Congress from New England.

In the absence of the author, Mr. H. K. Higgins, the Secretary read a paper entitled "Replacement of Bridges and Allied Structures." The Secretary also read discussions prepared by Messrs. J. P. Snow and J. R. Worcester.

The discussion was continued by Messrs. Swain, McKibben, Guppy, Fay, Cowles, Manley and others.

## JANUARY MEETING OF SANITARY SECTION.

A special meeting of the Sanitary Section was held at the Copley Square Hotel, Wednesday evening, January 9, 1907, forty-three members and guests being present.

Mr. L. D. Thorp, for the committee appointed at the last meeting to prepare a memorial to the late Freeman C. Coffin, reported progress.

The following resolutions were adopted by the Section :—

WHEREAS, Death has removed our late Chairman, Freeman C. Coffin, and we, the members of the Sanitary Section of the Boston Society of Civil Engineers, do sincerely mourn our loss; and

WHEREAS, He was not only our leader but chief among us in service and devotion; and

WHEREAS, To him was due not only the conception of the idea which was the basis for the organization of this Sanitary Section, but also much of the energy which brought it into being;

*Be it Resolved*, That we, the members of the Sanitary Section of the Boston Society of Civil Engineers, hereby express our sense of loss and our love for our friend and colleague;

*Be it Resolved*, That we do hereby express our sympathy for the family of our late Chairman;

*Be it Resolved*, That these resolutions be spread upon the records of the Society, and that a copy be sent to the wife and family of the deceased.

Mr. J. C. Chase, for the committee appointed to bring in a nomination for chairman for the unexpired term, reported the name of Leonard Metcalf, and the Secretary was instructed to cast one ballot for Mr. Metcalf.

Mr. M. N. Baker, Special Agent for the United States Census Bureau, made a few remarks in regard to the schedule for uniform sewerage statistics recently adopted by the Section, urging the general use of this schedule by those having charge of sewerage systems. Mr. Baker stated that the Census Bureau is now publishing municipal statistics from time to time under the heading "Social Statistics of Cities." The Bureau has decided to collect statistics in regard to sewerage and sewage disposal, and there is a prospect that at some time in the near future the agents will be sent into the field and a strenuous attempt made to collect such statistics. To a certain extent, the future action of the Bureau in this respect will be dependent upon the success of the efforts which are now being made by the Sanitary Section. If there is reasonable promise that the statistics exist and can be gathered together,



and that the engineers and superintendents in charge will coöperate in the matter, there is little doubt that the Bureau will adopt the schedule prepared by the Section, or a somewhat similar one.

The subject for discussion at the meeting was "The Use of Small Pumping Plants in Connection with Sewerage Systems." The discussion was opened by I. T. Farnham, L. D. Thorp and F. A. Barbour, and was participated in by C. O. Rogers, F. I. Hayes, Bertram Brewer, A. J. Gavett and others.

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## LIBRARY NOTES.

### BOOK REVIEWS.

*The Principles and Practice of Surveying.* By Charles B. Breed and George L. Hosmer. 8 vo. 526 + XIX pages. Published by John Wiley & Sons, New York.

[Donated by the authors and publishers.]

This book is an elementary treatise that covers the Use, Adjustment and Care of Instruments; Surveying Methods; Computations; and Plotting. The purpose of the treatise is evidently not to present novel methods, but rather to present common methods in new lights. The language of the book is well adapted to an elementary treatise. It is plain and interesting, Problems and exercises at the ends of certain chapters add to the value of the book. The subject of the Stadia has been omitted, but will be introduced, I understand, in subsequent editions.

F. B. SANBORN.

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### RECENT ADDITIONS TO THE LIBRARY.

Cambridge, Mass., Annual Report of the Water Board, 1906.  
New York City, Report of Rapid Transit R. R. Commissioners, 1905.

New Hampshire, Annual Report Railroad Commissioners, 1906.

Ohio, Annual Report State Board of Health, 1905.

## GIFT OF CLEMENS HERSCHEL, C. E.

Principal Professional Papers of Dr. J. A. L. Waddell, Civil Engineer, 1906.

Die Technik der Lastenförderung einst und jetzt, Kammerer-Charlottenburg, 1907.

Subject Matter Index of Technical and Scientific Periodicals, compiled by order of the Imperial Patent Office, 1905, Berlin.

## LIST OF MEMBERS.

## ADDITIONS.

WILBUR W. DAVIS	. . . . .	15 Beacon St., Boston.
BENJAMIN FOX	. . . . .	16 State St., Boston.
G. FRANKLIN HOOKER	. . . . .	35 Granite St., Cambridge, Mass.
LEONARD C. ROBINSON	. . . . .	Concord, Mass.
JOHN J. ROURKE	Asst. Engr., B. & M. R. R.,	North Station, Boston.
JOHN A. STARR	. . . . .	54 Irving St., Watertown, Mass.

## CHANGES OF ADDRESS.

FRED. R. DAVIS	. . . . .	1515 Arch St., Philadelphia, Pa.
ARTHUR C. HOLT	. . . . .	197 Washington St., Somerville, Mass.
WINFRED D. HUBBARD	. . . . .	133 Fair St., Kingston, N. Y.
CHARLES T. MAIN	. . . . .	Room 911, 45 Milk St., Boston.
ALEXANDER P. MILNE	. . . . .	4 State St., Boston.
RUFUS K. PORTER	. . . . .	47 Hancock St., Auburndale, Mass.
JAMES RICE	. . . . .	Clayton House, Wilmington, Del.
CHARLES SAVILLE	. . . . .	140 State House, Boston.
G. EDWARD SLEEPER	. . . . .	139 Hawthorne Ave., Yonkers, N. Y.
SIDNEY SMITH	. . . . .	Tiverton, R. I.
L. LEE STREET	. . . . .	27 Salcombe St., Dorchester, Mass.

## NEW ENGINEERING WORK.

(Under this head the Excursion Committee proposes to present each month a brief resume of engineering work in progress in New England, as far as such information is readily obtainable. The assistance of members is desired, and items of interest will be gladly received. Such items are intended to include not only works of exceptional magnitude or containing novel features, but also engineering construction work of all kinds and all degrees of magnitude. Notes should be in the hands of the Committee not later than the 2nd Wednesday of each month. The thanks of the Committee are due to the members who have furnished data for the Bulletin.—E. M. BLAKE, Secretary, Excursion Committee, 8 Beacon St., Boston.)

**Commonwealth of Massachusetts.**—**METROPOLITAN PARK COMMISSION.**—The work of construction under the direction of this department is practically entirely suspended on account of the weather conditions. A brief outline of the principal work contemplated for this year is as follows :

Surfacing and finishing of section of drive along the Charles River through United States Arsenal Grounds in Watertown.

Extension of the concrete sea wall and shore drive along Lynn Shore Reservation, from its present ending near Red Rock to the Nahant line.

Construction of Lynn Fells Parkway from Middlesex Fells Reservation to Green St. in Melrose for a length of  $1\frac{1}{2}$  miles.

Construction of a reinforced concrete bridge for the Southern Division of the Boston & Maine Railroad over the drive along Mystic River at West Medford; and the surfacing and finishing of the drives along the river from High St., West Medford, to Cradock Bridge, Medford, a total length of about 3 miles.

Also the construction of dam, tide gates and sluices in the Mystic River near Cradock Bridge, Medford, for the purpose of excluding tide water from the river above this point and establishing the water in the basin at a permanent elevation of about grade 7.0. This work will be constructed principally of plain and reinforced concrete.

The surfacing and finishing of the drive along Quincy Shore Reservation from Atlantic St. to the National Soldiers' Home, a distance of about 2 miles.

**CHARLES RIVER BASIN COMMISSION.**—But little work has been done during the past month, owing to the very unfavorable weather conditions. The sluice gates for the sluices at the Cambridge side are being furnished by the Coffin Valve Co. and are beginning to be erected. There are 8 of these gates, each 7 feet 6 inches

wide by 10 feet high. They are to be operated electrically from a switchboard in the chamber at the sluices; each is controlled by an independent motor of 5 H. P. The work of laying the rails in the lock recesses for the lock gates is going on.

**Boston Transit Commission.**—Work is progressing on the Washington St. Tunnel between State St. and Adams Sq., between Hanover St. and Haymarket Sq., and on the north side of Haymarket Sq. at the Relief Station, and is also progressing on the Franklin St. and Essex St. Stations.

**Boston Elevated Railway.**—**SURFACE LINES.**—Plans are under way for extensions to the Lincoln and Charlestown Power Stations.

**Boston & Albany Railroad.**—**CLYDE ST. PIER.**—The piling is being driven and work of capping is in progress.

**ABOLITION OF GRADE CROSSINGS.**—*Newton Centre.*—Parapet stones are being cut for the abutments. Alterations on the passenger station are being carried forward.

The steel bridge for Langley Road will soon be placed in position.

*East Boston.*—Concrete is being laid for retaining walls south of Curtis St., weather permitting.

Saratoga St. abutments have recently been completed.

**City of Cambridge.**—*Work on Pipe Tunnels Under Broad Canal.*—The pipe tunnel under Broad Canal at Third St. is now completed and work is progressing on a similar pipe tunnel under Broad Canal at First St. The heading for the latter tunnel has progressed about 50 feet from the north shaft. The contractor has also started sinking the shafts for a third pipe tunnel under Broad Canal at Sixth St.

All of these tunnels are being constructed under air pressure, the maximum pressure being about 14 pounds. The completed tunnel at Third St. has a finished diameter of 6 feet 6 inches, is 110 feet long between centres of shafts and is about 40 feet from street level to subgrade. The tunnel at First St. will have a finished diameter of 6 feet, will be about 156 feet long between centres of shafts and about 50 feet from street level to subgrade. The tunnel at Sixth St. will have a finished diameter of 6 feet, will be about 110 feet between centres of shafts and about 40 feet from street level to subgrade. The work on all these tunnels is being done by the Charles R. Gow Company.





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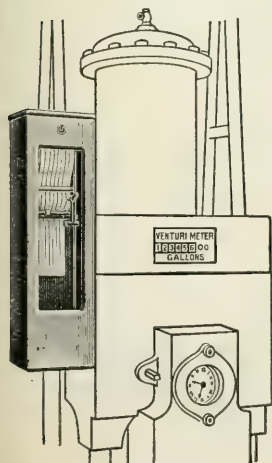
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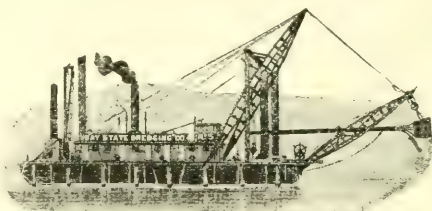
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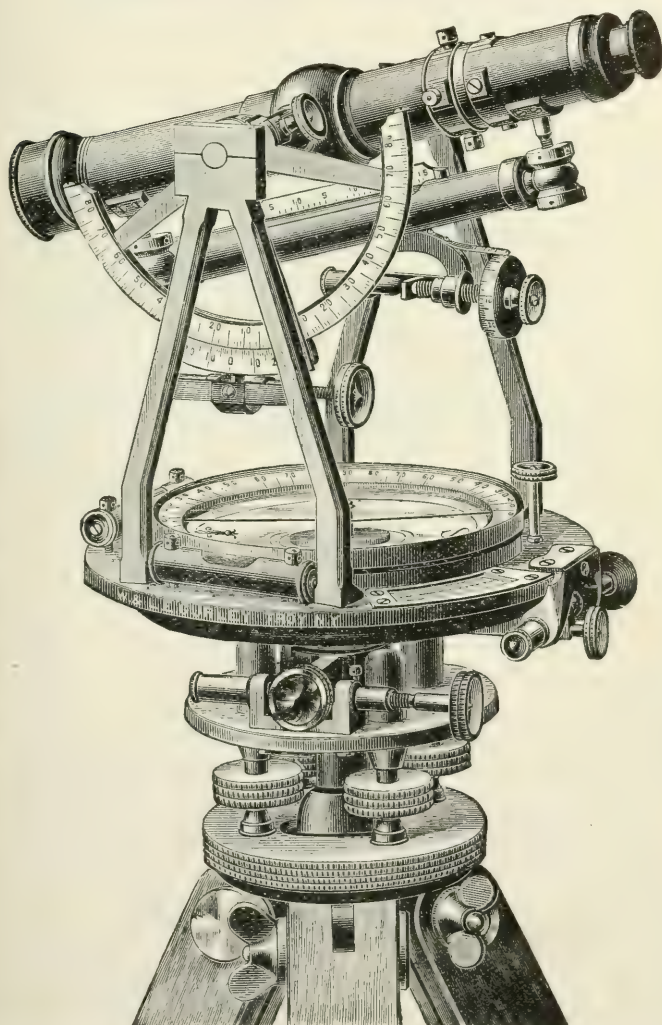
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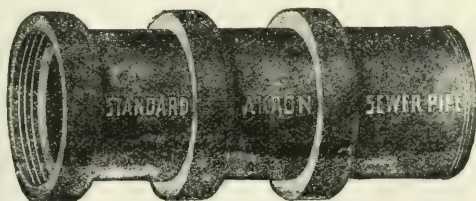
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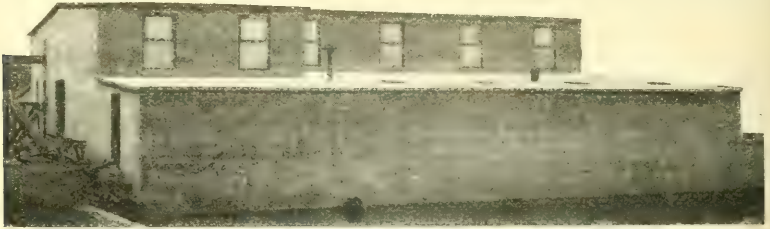
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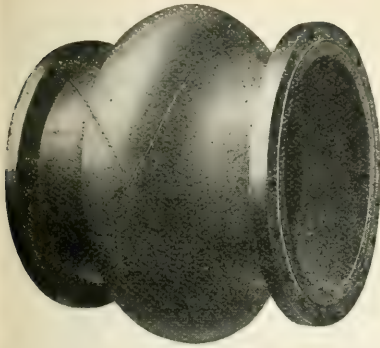
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# BOSTON SOCIETY OF CIVIL ENGINEERS.

ORGANIZED JULY 3, 1848.

## MONTHLY BULLETIN.

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NEW SERIES.

MARCH, 1907.

No. 10.

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### ANNUAL MEETING.

The annual meeting of the Boston Society of Civil Engineers will be held on Wednesday, March 20, 1907, at 7.30 o'clock P. M., in

CHIPMAN HALL, TREMONT TEMPLE, BOSTON.

**BUSINESS:** To receive the annual reports of the Board of Government, of the Treasurer, and of the Secretary.

To receive the annual reports of the several special committees of the Society.

To reappoint the several special committees.

Announcement of result of letter-ballot for officers for the ensuing year.\*

At the conclusion of the business the President will give an account of some difficulties encountered in early State surveys, how they were overcome and the results obtained.

S. E. TINKHAM, *Secretary.*

### EXCURSION.

There will be an excursion on Wednesday, March 20, 1907, through the northerly part of the Washington-St. Tunnel. Members will meet at the Transit Commission field office, Old State House, at 12 M. Parties will enter the work at the Ames Building at Court St., and go through to Haymarket Sq. Visitors are requested to provide themselves with rubbers, old coats and hats.

EXCURSION COMMITTEE.

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\* Letter-ballots will be received until 8 o'clock P. M., of March 20, 1907.



## BINDING THE JOURNALS.

Members who wish the Secretary to attend to the binding of their numbers of the *Journal* are requested to send them to Room 715, Tremont Temple, Boston, before MARCH 20.

Arrangements have been made by which members can have the *two* volumes bound in *one* for 70 cents, or each volume bound separately for 40 cents each; the style of binding to be the same and uniform with that of former years. Mark clearly which way it is desired the binding shall be done.

## MEMBERSHIP CARDS.

The membership cards for 1907 are now ready for distribution, and one will be mailed to any member who applies to the Secretary for it.

## CANDIDATES FOR MEMBERSHIP.

To be balloted on at meeting March 20, 1907.

EDWARD HUTCHINS, East Walpole, Mass., (b. 1877). Graduate of Worcester Polytechnic Institute, 1903. From October, 1900, to June, 1902, was with A. P. Rice, Worcester, partly on construction work and partly drafting. In June, 1903, started drafting for Lombard Improved Water Wheel Governor Co. and stayed with them till September, 1903, then went to work for H. S. Ferguson, C. E., Millinocket, Me.; June, 1906, left the employ of Mr. Ferguson and at present is engineer for F. W. Bird & Son, East Walpole. Recommended by L. P. Kinnicutt, H. K. Barrows, J. W. Tower and H. S. Ferguson.

CHARLES F. KNOWLTON, Marlborough, Mass., (b. 1865). With Norman & Weaver, water works construction, 1883-84; travelling 1885-89; in city engineer's office, Duluth, Minn., 1889-90; assistant engineer with Everett Land Co., Everett, Wash., 1891-95; resident engineer, Mass. Highway Commission, 1895 and 1899; commissioner of public works, Quincy, Mass., 1896-98 and 1900-04; superintendent for Contractor, E. W. Everson & Co., 1905; city engineer and superintendent of streets for City of Marlborough, 1906; and at present manager of Hassam Paving Dept. for Simpson Bros. Corporation, Boston. Recommended by F. E. Tupper, F. H. Fay, Perry Lawton and W. S. McKenzie.

## APPLICATIONS FOR MEMBERSHIP.

The following applications for membership have been received and are now before the Board of Government for approval. Members having information which will assist the government in its consideration of these applications are requested to communicate at once with any member of the Board. Communications will be regarded as confidential and for the use of the Board alone.

### AS MEMBERS.

GEORGE HERBERT BRAZER, Dorchester, Mass., (b. 1873). Was employed from 1893 to 1896 by various engineers and surveyors on surveying, inspecting and draughting for road building, sewer construction and topographical work; from 1896 to 1899 was employed by the Boston Transit Commission as transitman and draughtsman; from 1899 to Oct., 1906, with J. R. Worcester, consulting engineer, as draughtsman and assistant engineer; and since Oct., 1906, member of firm of J. R. Worcester & Co., consulting engineers, Boston. Recommended by E. E. Pettee, J. R. Worcester, C. R. Gow and L. B. Manley.

EDWARD WEBSTER HADCOCK, Wakefield, Mass., (b. 1881). Two years at Massachusetts Institute of Technology, class of '02. Employed in summer of 1899 as rodman by Pierce & Barnes, Civil Engineers, Boston. Since July, 1900, has served in the various grades of the Engineering Department of Massachusetts Harbor and Land Commission, with exception of spring of 1906 when he was employed as assistant engineer by United Fruit Co., in Sanitation Department, at Bocas del Toro, Panama. Now assistant engineer with Harbor and Land Commission. Recommended by F. W. Hodgdon, H. B. Wood, L. H. Bateman, J. R. Burke and R. H. Barnes.

## MINUTES OF MEETING.

### FEBRUARY MEETING OF THE SOCIETY.

A regular meeting of the Boston Society of Civil Engineers was held at Chipman Hall, Tremont Temple, Boston, on Wednesday, February 20, 1907, at 8 o'clock P. M. Eighty-eight members and visitors present.

In the absence of the President and the Vice-President Mr. Frederic P. Stearns was elected chairman of the meeting. The record of the last meeting was read and approved.

Messrs. Theodore W. Norcross and Robert L. Read were elected members of the Society.

On motion of Mr. Street the thanks of the Society were voted to the Charles R. Gow Company for courtesies extended to members this afternoon on the occasion of a visit to the Subway under construction at First St., Cambridge.

The discussion of the evening, on Engineers' Specifications from the Contractor's Point of View, was opened by Mr. James W. Rollins, Jr. Other members who took part in the discussion were: Messrs. Charles G. Craib, Charles R. Gow, E. S. Dorr, L. S. Cowles, J. H. Gerrish, E. S. Larned, E. P. Adams and G. T. Sampson. The discussion was closed by Mr. Rollins, who read several letters which he had received bearing on the question.

## LIBRARY NOTES.

### RECENT ADDITIONS TO THE LIBRARY.

#### BY PURCHASE.

Reinforced Concrete, by Buel & Hill.

Concrete Block Manufacture, by Harmon Howard Rice.

Concrete and Reinforced Concrete Construction, by Homer A. Reid.

Modern Tunnel Practice, by David M. Stauffer.

Pumps and Hydraulics, by William Rogers.

Steam Turbines, by Carl C. Thomas.

Garbage Crematories in America, by William M. Venable.

Handbook of Cost Data, by H. P. Gillette.

Details of Bridge Construction, Plate Girders, by F. W. Skinner.

Ice Formation, by Howard T. Barnes.

Hydraulic Machinery, by Robert G. Blain.

Principles of the Manufacture of Iron and Steel, by I. Lowthian Bell.

Disposal of Municipal Refuse, by H. de B. Parsons.

Electric Transmission of Water Power, by Alton D. Adams.

Elements of Sanitary Engineering, by Mansfield Merriman.

#### BY GIFT.

Lawrence, Mass., Annual Reports of City Engineer for 1904 and 1905.

Providence, R. I., Dept. of Public Works, Quarterly Report, Dec. 1906.

St. Louis, Mo., Annual Report of Water Comrs., 1905-6.

Pennsylvania, Report of Water Supply Commission, 1905-6.

U. S. Statistics of Railways, 18th Annual Report, 1905.

American Water Works Association, Proceedings of 26th Annual Convention, 1906.

## LIST OF MEMBERS.

### ADDITIONS.

THEODORE W. NORCROSS	. . .	43 Bridge St., Springfield, Mass.
ROBERT L. READ	. . .	68 Summer St., Malden, Mass.

### CHANGES OF ADDRESS.

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H. J. GLENDENNING	. . .	175 Warren Ave., Boston.
W. B. HAMMOND	. . .	91 Westland Ave., Boston.
D. A. HARRINGTON	. . .	20 Pemberton Sq., Boston.
EPHRAIM HARRINGTON	. . .	20 Pemberton Sq., Boston.
A. E. HATCH	. . .	185 Summer St., Boston.
C. W. KETTELL	. . .	Lexington, Mass.
J. H. LIBBEY	. . .	14 Parsons St., West Newton, Mass.
A. P. MILNE	. . .	88 Broad St., Boston.
G. O. W. SERVIS	. . .	City Hall, Melrose, Mass.
W. F. SULLIVAN	Engr. & Supt.,	Pennichuck Water Works, Nassau, N. H.



## NEW ENGINEERING WORK.

Under this head the Excursion Committee proposes to present each month a brief résumé of engineering work in progress in New England, as far as such information is readily obtainable. The assistance of members is desired, and items of interest will be gladly received. Such items are intended to include not only works of exceptional magnitude or containing novel features, but also engineering construction work of all kinds and all degrees of magnitude. Notes should be in the hands of the Committee not later than the 2nd Wednesday of each month. The thanks of the Committee are due to the members who have furnished data for the Bulletin.—E. M. BLAKE, Secretary, Excursion Committee, 8 Beacon St., Boston.)

### Commonwealth of Massachusetts.—HIGHWAY COMMISSION.

The State Highway work in the following places will be resumed as soon as the weather conditions are favorable :

Becket	Haverhill	Norton
Bedford	(Bridge)	Pittsfield
Burlington	Holliston	Rehoboth
Carlisle	Huntington	Rockport
Chicopee	Lee	Scituate
Deerfield	Manstield	Spencer
Dighton	Middleboro	Tewksbury
Falmouth	Montague	Westboro
Gloucester	Northampton	

**Charles River Basin Commission.**—During the past month there has been little or no progress made on most parts of the work owing to the unfavorable weather conditions. Good progress has, however, been made on the draw-bridge over the lock and the structural steel work is practically all in place and ready to be riveted. This bridge is of the Scherzer rolling lift, single leaf type, made in two halves; that is, two placed side by side. In opening it tips up towards the Cambridge side so as not to interfere with the view of the operator, but permit him to have an unobstructed view along the lock. It is to be operated electrically and is being built by the American Bridge Company.

Bids are now being figured for the machinery for operating the lock gates. These bids will be opened on March 18.

**City of Boston.**—ENGINEERING DEPARTMENT.—*Atlantic Avenue Bridge*, over the Yard of the Boston Terminal Company and Fort Point Channel.—The erection of the steel superstructure of the draw span is nearly complete and the draw was swung into position for the first time March 6. Work is now in progress on laying the wooden floor and setting up the turning machinery of the draw span.

**Boston Transit Commission.**—Work is progressing on Washington-St. Tunnel entrances, respectfully situated at Essex St., at Franklin St., between the Old South Building and the Old South Meeting House and on the entrance on Washington and Union Sts., for the station which is to extend from near Hanover St. to Haymarket Sq.; and work is also progressing on the main tunnel structure just north of State St. and on another portion under the Relief Station.

**Boston & Albany Railroad.**—**ABOLITION OF GRADE CROSSINGS.**—*Newton Highlands.*—Plate girder bridges are being placed at Langley Road and Center St. The one at Center St. has a span of 108 feet. Ditch walls are being constructed in front of the station, which will complete all the masonry on this work. The work under way on the passenger station comprises the construction of granolithic stairs and the regular station platform shelters.

*East Boston.*—Concrete retaining walls are under construction near Curtis St., the balance of the work having been discontinued until more favorable weather.

*Clyde St. Pier.*—Work is still under way on the piles and girder caps for the new pier.

*Kneeland St. Warehouse.*—All the concrete work for this warehouse has been completed with the exception of the elevators, which are now being installed; the work is substantially finished.

**New York, New Haven & Hartford R. R.**—**BOSTON FREIGHT TERMINALS.**—All of the Simplex Concrete Piles, spoken of in the previous Bulletin, are driven. One of the two brick freight houses has been completed and the other is all closed in ready for the concrete floor. The wooden house, 1000 feet long, has been cut in halves, and one-half has been moved from B St. to C St., its new position, and is now being used for freight traffic. The second half is being moved in two sections, 250 feet of which is now across B St. in position.

**ABOLITION OF GRADE CROSSING AT DUDLEY ST., BOSTON.**—The abolition of the Dudley St. grade crossing probably requires the largest expenditure for the abolition of any single grade crossing yet undertaken in the State, at a cost of \$485,000.

This provides for raising the grade of the Midland Division of the New York, New Haven & Hartford Railroad for about one mile, and raising existing bridges at Massachusetts Ave., Norfolk

Ave. and Cottage St., including concrete abutments, and the lowering of the water and gas mains, tubes of the Pneumatic Service Company, and 24 inches by 18 inches brick sewer in Dudley St.

It is proposed to build in addition a concrete passenger subway at the Dudley St. station.

**Boston Elevated Railway.**—ELEVATED CONSTRUCTION.—

*Sullivan Sq. Storage Yard.*—Work will soon be resumed on foundations for the completion of the Sullivan Sq. Storage Yard. Steel for this work will arrive early in the Spring and the work will be pushed rapidly to completion.

*South Approach, Washington St. Tunnel.*—Active work for the elevated structure and masonry incline connecting the southerly entrance to the Washington St. tunnel with the existing structure at Castle and Washington Sts. will start soon.

**SURFACE LINES.**—Work is under way for the addition to the Charlestown power station and active work will soon begin on the proposed addition to the Lincoln power station.

**Somerville, Mass.**—Simpson Bros. Corporation are erecting in Somerville a concrete block plant where they will manufacture hydraulic pressed concrete blocks under a pressure of approximately 100 tons per square foot of surface. Their plant will probably be running by April 1st and will have capacity enough to turn out blocks for several large buildings the coming season.

**Stamford, Conn.**—The Yale & Towne Manufacturing Company has recently awarded to Frank B. Gilbreth, New York, contracts for building extensions to their press shop and cabinet lock department at Stamford, Conn. This press shop extension will be one story high, approximately 60 feet by 156 feet, resting on 40-foot piles, with brick walls and timber roof with saw-tooth skylights. The floor will be of reinforced concrete, designed for a live load of 250 pounds. The cabinet lock department extension will be one story high, 42 feet by 80 feet, of wood construction with gravel roof, and concrete foundation and retaining wall. The work will cost about \$40,000, and is to be pushed forward as rapidly as possible after the beginning of milder weather. This is a repeat order, and will be the sixth and seventh building constructed for the Yale & Towne Company by Mr. Gilbreth.

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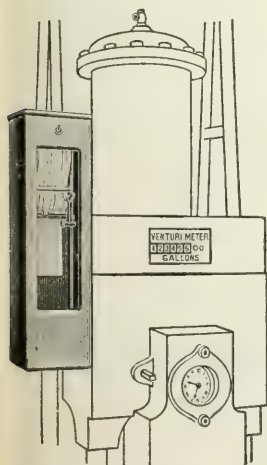
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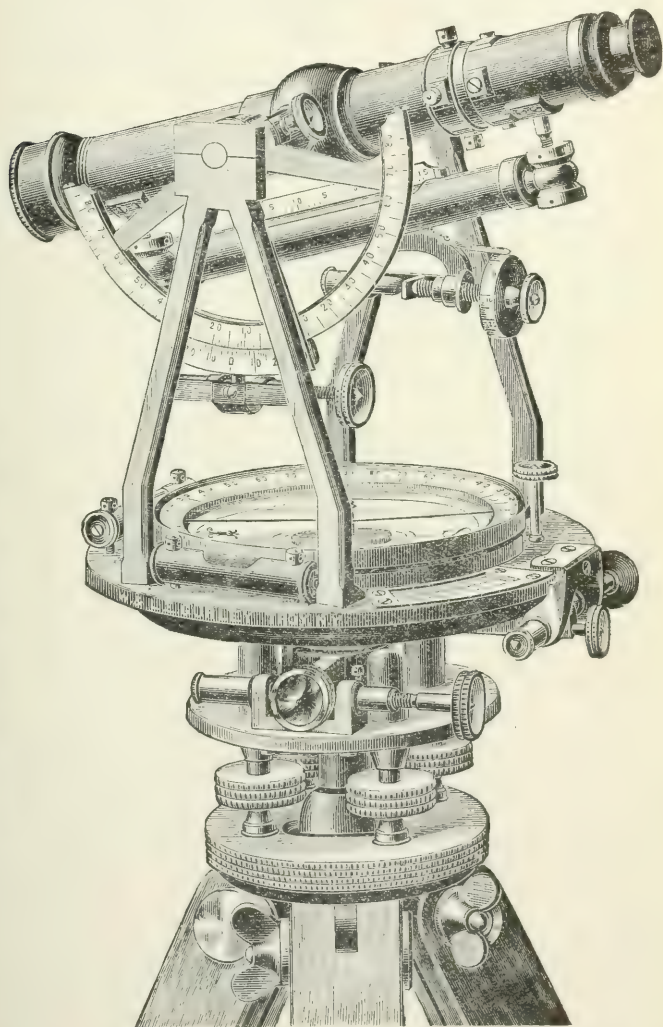
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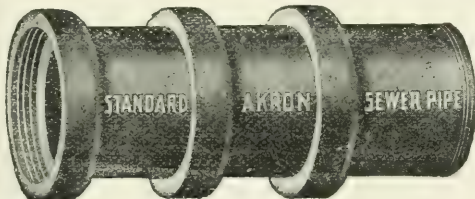
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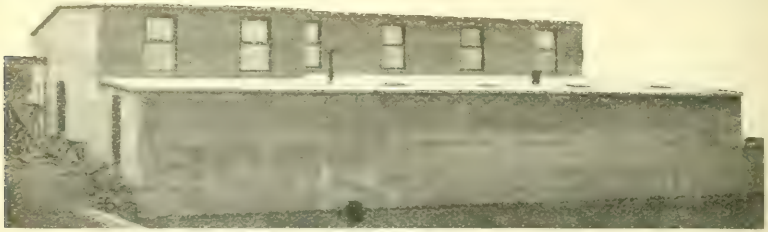
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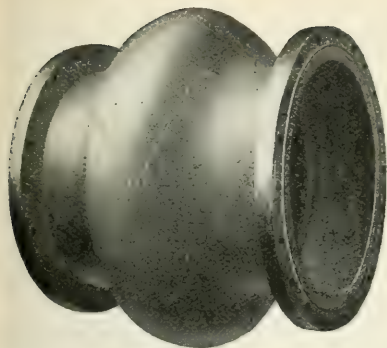
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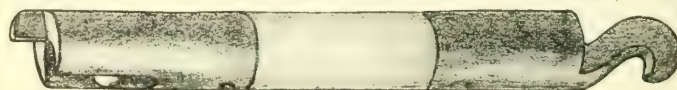
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**ORGANIZED JULY 3, 1848.**

## **MONTHLY BULLETIN.**

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NEW SERIES.

APRIL, 1907.

No. 11.

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### **REGULAR MEETING.**

A regular meeting of the Boston Society of Civil Engineers will be held on Wednesday, April 17, 1907, at 7.30 o'clock P. M., in

CHIPMAN HALL, TREMONT TEMPLE, BOSTON.

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Mr. George B. Francis will read a paper entitled "Pennsylvania Terminal Station in New York City, and the Engineering Problems Connected Therewith." The paper will be illustrated by a large number of lantern slides.

S. E. TINKHAM, *Secretary.*

### **SANITARY SECTION MEETING.**

There will be a special meeting of the Sanitary Section at the Copley Square Hotel, Wednesday evening, May 1, 1907, at 7.30 P. M.

The topic for discussion will be "Gagings of Run-off from Sewered Areas." Several members have signified their intention of describing the methods which have been adopted for securing data in regard to run-off and of presenting summaries of the results. The appointment of a committee for the collection of statistics in regard to run-off under different conditions will be considered at this meeting.

WILLIAM S. JOHNSON, *Clerk.*



## CANDIDATES FOR MEMBERSHIP.

To be balloted on at meeting April 17, 1907.

GEORGE HERBERT BRAZER, Dorchester, Mass., (b. 1873). Was employed from 1893 to 1896 by various engineers and surveyors on surveying, inspecting and draughting for road building, sewer construction and topographical work; from 1896 to 1899 was employed by the Boston Transit Commission as transitman and draughtsman; from 1899 to Oct., 1906, with J. R. Worcester, consulting engineer, as draughtsman and assistant engineer; and since Oct., 1906, member of firm of J. R. Worcester & Co., consulting engineers, Boston. Recommended by E. E. Pettee, J. R. Worcester, C. R. Gow and L. B. Manley.

EDWARD WEBSTER HADCOCK, Wakefield, Mass., (b. 1881). Two years at Massachusetts Institute of Technology, class of '02. Employed in summer of 1899 as rodman by Pierce & Barnes, Civil Engineers, Boston. Since July, 1900, has served in the various grades of the Engineering Department of Massachusetts Harbor and Land Commission, with exception of spring of 1906 when he was employed as assistant engineer by United Fruit Co., in Sanitation Department, at Bocas del Toro, Panama. Now assistant engineer with Harbor and Land Commission. Recommended by F. W. Hodgdon, H. B. Wood, L. H. Bateman, J. R. Burke and R. H. Barnes.

## APPLICATIONS FOR MEMBERSHIP.

The following applications for membership have been received and are now before the Board of Government for approval. Members having information which will assist the government in its consideration of these applications are requested to communicate at once with any member of the Board. Communications will be regarded as confidential and for the use of the Board alone.

### AS MEMBERS.

THOMAS FRANCIS BOWER, Boston, (b. 1869). Attended Haverland Academy until 1886, Canisius College, Buffalo, N. Y., 1886-7 and graduated from Cornell University, College of Civil Engineering, with degree of C. E. in 1891. Employed by City of Newton, Mass., with A. F. Noyes, 1891 to 1894; with B. R. Felton, C. E., Stoneham and Melrose, Mass., Sewerage system in 1895; and from 1895 to date in Sewer Department, City of Boston; since 1900 as District Engineer in charge of Roxbury, South Boston and North Dorchester districts. Recommended by E. S. Dorr, C. R. Cutter, I. T. Farnham and C. H. Dodd.

**CHARLES SIDNEY BRYER**, Newton, Mass., (b. 1871). Graduated from University of Maine, Class 1897, with degree of B. C. E. In 1899 with N. E. Structural Co., Everett, Mass., as draftsman; 1899 and 1900, with Canso & Louisburg Ry. Co. (Port Hawksbury, N. S.) as instrument man; 1900 to 1902 with City of Boston, Sewer Dept., as draftsman; and since 1902, with Harbor and Land Commission, as instrument man and assistant engineer, now in charge of dredging in Boston Harbor. Recommended by F. W. Hodgdon, F. N. Wales, J. R. Burke, L. H. Bateman and A. L. Kidd.

**FRANK ARTHUR LEAVETT**, Newton, Mass., (b. 1874). Graduated from Abington High School in June, 1890. From Sept., 1890, until July, 1894, with A. H. French, C. E., as rodman, transitman and inspector on general municipal engineering work; in July, 1894, was appointed assistant engineer and inspector for the Town of Brookline, and has had charge of most of the construction work under the Town Engineer, including Smelt Brook Improvement, \$52,000, Longwood Ave. Bridge, \$115,000, and Boylston St. Improvement, \$25,000. At present is second assistant engineer, Brookline Engineering Department. Recommended by A. H. French, H. A. Varney, H. F. Bryant and F. F. Forbes.

**ERNEST MASBRY MOSES**, Waltham, Mass., (b. 1876). Graduated from the Lawrence Scientific School with degree of S. B. in civil engineering in 1897. Draftsman with Boston Bridge Works from Aug., 1897, to Sept., 1899; with J. R. Worcester, C. E., from Oct., 1899, to Dec., 1905; since Jan., 1906, with Boston Elevated Railway Co. as draftsman in the Department of Elevated Construction. Recommended by J. C. Moses, E. E. Pettee, J. R. Worcester and L. S. Cowles.

**DANIEL SCOULER, JR.**, Quincy, Mass., (b. 1884). Graduated from Baltimore Manual Training School, 1900. From July, 1900, to March, 1905, draftsman with Fore River Ship Building Co; May, 1905, to June, 1906, draftsman with Philadelphia Rapid Transit Co.; July, 1906, to date, draftsman with Boston Elevated Railway Co., Department of Elevated Construction. Recommended by C. T. Fernald, H. C. Hartwell, G. A. Kimball and L. S. Cowles.

**HARRIE LAWRENCE WHITNEY**, Beverly, Mass., (b. 1880). Educated at Sawin Academy and Dowse High School, Class '97, at Sherborn, Mass., Burdett College, Boston, 1898, 1899, and at Mass. Institute of Technology, Class '05. Employed by United Shoe Machinery Co. at Winchester, Mass., 1899-1901; by A. G. Tomasello, contractor at Boston, as engineer during 1905; Resident Engineer with Sewer Department, City of Beverly, 1905-1907; and on Feb. 1, 1907, was appointed and elected City Engineer of Beverly, Mass. Recommended by C. F. Allen, C. B. Breed, F. H. Fay and C. F. Knowlton.

## LIST OF MEMBERS.

### ADDITIONS.\*

EDWARD HUTCHINS	.	.	.	.	.	East Walpole, Mass.
CHARLES F. KNOWLTON	.	.	.	.	.	85 Wyoming Ave., Melrose, Mass.

## RESIGNATIONS.

WILLIAM H. BRADLEY	.	.	.	.	.	.	March 20, 1907.
EDWARD B. CARNEY	.	.	.	.	.	.	" " "
WILLIAM H. CHAPMAN	.	.	.	.	.	.	" " "
GEORGE E. EVANS	.	.	.	.	.	.	" " "
DAVID HINCKLEY	.	.	.	.	.	.	" " "
JOHN H. KINEALY	.	.	.	.	.	.	" " "
WALDO A. LEARNED	.	.	.	.	.	.	" " "
CHARLES S. ROBBINS	.	.	.	.	.	.	" " "
EDWARD D. SABINE	.	.	.	.	.	.	" " "
WALTER B. SNOW	.	.	.	.	.	.	" " "
OTTO SONNE	.	.	.	.	.	.	" " "
FRANK W. UPHAM	.	.	.	.	.	.	" " "

A new list of members is now in the hands of the printer and will be issued about May 1st. Changes of address can be made if received by the Secretary before April 20th.

## MINUTES OF MEETINGS.

BOSTON, MASS., MARCH 6, 1907. — The annual meeting of the Sanitary Section of the Boston Society of Civil Engineers was held at the Society rooms, Wednesday evening, March 6, 1907, with 31 members present.

The report of the Executive Committee was read by the chairman, and was accepted and placed on file.

The Clerk read a memoir of William W. Burnham, a member of the Section, who died August 11, 1906.

Upon motion of Mr. Sherman it was voted that a committee be appointed by the chair to nominate officers for the ensuing year. The chairman appointed H. P. Eddy, C. W. Sherman and E. W. Branch as members of this committee.

On motion of Mr. Farnham it was voted that a committee be appointed by the chair to oppose the passage of a bill now before the legislature for the extension of civil service laws to heads of municipal departments. Later in the evening this motion was reconsidered, and after considerable discussion it was voted to instruct the chairman to request the Board of Government of the main society to appoint a committee to consider the relation of civil service laws to engineers.

The committee appointed to nominate officers for the ensuing year reported and, in accordance with the instructions of the Section, the Chairman cast one vote for each of the following candidates, who were declared elected.

Chairman — Arthur T. Safford.

Vice-Chairman — Irving T. Farnham.

Clerk — William S. Johnson.

Executive Committee — George A. Carpenter, Lewis D. Thorpe, George E. Bolling.

The paper of the evening was presented by Arthur T. Safford, the subject being "Waste from Lowell Gas Light Company's Yard." The paper was discussed by Messrs. Barnum, H. W. Clark, W. E. McKay, George Bowers and others.

### ANNUAL REPORT OF THE EXECUTIVE COMMITTEE OF THE SANITARY SECTION.

*To the Members of the Sanitary Section of the Boston Society of Civil Engineers.*

*Gentlemen:* Your Executive Committee reports with pleasure continued interest and activity in the affairs of the Sanitary Section. During the past year six meetings have been held, with an average attendance of 39 persons, as follows:



March 7, 1906, annual meeting, attendance 70. Papers, "An Account of Several of the Small Sewage Disposal Systems which have been Constructed to Protect the Purity of the Metropolitan Water Supply," by William W. Locke; "The Sewage Disposal Plant at Vassar College," by Ellen M. Richards; "The Sewage Disposal Plant at the State Colony for Insane at Gardner," by J. J. Van Valkenburgh; "The Sewage Disposal Plant of the State Normal School at Hyannis," by George H. Wetherell, Jr.

April 11, 1906, special meeting for the consideration of uniform sewerage statistics.

June 9, 1906, attendance 41. Excursion to the plants of the City Refuse Utilization Company and the New England Sanitary Product Company. Paper, "Modern Methods of Garbage Disposal," by William F. Morse. Dinner at the Point Shirley Club, Winthrop.

October 10, 1906, attendance 42. Paper, "The Relation of the Suspended Matter in Sewage to the Problem of Sewage Disposal," by H. P. Eddy, and A. L. Fales.

December 5, 1906, attendance 38. Paper, "The Maintenance of Sewage Filters in Winter," by G. E. Borden, E. C. Frost and E. R. B. Allardice.

January 9, 1907, attendance 43. Paper, "The Use of Small Pumping Plants in Connection with Sewage System," by I. T. Farnham, Lewis D. Thorpe and F. A. Barbour.

On November 11, 1906, Mr. Freeman C. Coffin, chairman of the Section, died, as previously reported to you. A memoir on Mr. Coffin's life was prepared, and resolutions of sympathy were passed, spread upon the minutes of the Section and sent to Mr. Coffin's family. Mr. Leonard Metcalf was chosen, on January 9, 1907, to fill the vacancy left by Mr. Coffin's death.

The subject of uniform sewerage statistics was carefully considered, and after a full discussion the report of the committee, recommending a form for the presentation of sewerage statistics, was adopted by the Section on June 9, 1906. It seems wise to call to the attention of members the desirability of the adoption, by municipalities and superintendents of sewerage plants, as far as possible, of this form for the presentation of sewerage statistics, in order that the results of operation and maintenance of these works may be as nearly comparable as possible. In this connection we call to your attention a letter written to Mr. M. N. Baker by Mr. L. G. Powers, chief statistician of the Bureau of the Census in the Department of Commerce and Labor, Washington, D. C.

DIVISION OF AGRICULTURE.  
DEPARTMENT OF COMMERCE AND LABOR.  
BUREAU OF THE CENSUS.

WASHINGTON, D. C., February 23, 1907.

Mr. M. N. BAKER, Expert Special Agent,  
220 Broadway, New York:

*Dear Mr. Baker,* — Returning from New York on Thursday, I found your letter of the fourteenth instant on my desk, and in accordance with our conversation on this subject, I make formal answer thereto.

As stated in that conversation, it seems to me that the true position of the census with reference to the schedule of the Boston Society of

Engineers is as follows: The census office accepts that schedule tentatively as a basis of future work, and will proceed to make use of the same in the collection of data for its statistical publications so soon as a sufficient number of cities, through their engineering department, adopt that schedule in recording data.

They could further state in their report that the census is at present compiling statistics on sewers and sewage disposal which embody only a few of the most important facts called for by that schedule, and there are great breaks in those statistics owing to the imperfect classification, or want of classification, employed by the various engineering departments of the country.

I herewith return the letter from Mr. Johnson forwarded by you.

With best wishes, I am

Yours very truly,

(Signed) L. G. POWERS, *Chief Statistician.*

It is manifest that unless general use is made of the form outlined, the adoption of it by the Bureau of the Census cannot be hoped for, and much valuable information will thus be lost, or at least will remain unavailable to the great majority of those interested in this subject.

The present membership of the Section numbers: members of main society 156; Section members 29; total, 185.

Your Executive Committee bespeaks the active personal interest of every member of the Section in striving to increase the membership and the usefulness of the Section in every way possible. Many superintendents or managers of sewerage systems and sewage disposal plants are not at present enrolled upon the membership of the Section. Some means should be found of reaching these men and of impressing upon them the fact that men who have had practical experience in the operation of such works are particularly welcome, whether of technical attainment or not.

The Executive Committee will welcome suggestions for timely papers or topics for discussion, especially the latter.

Respectfully submitted,

LEONARD METCALF,  
*For the Executive Committee.*

#### TWENTY-FIFTH ANNUAL DINNER.

The twenty-fifth annual dinner of the Boston Society of Civil Engineers was served at the Hotel Vendome, Boston, Tuesday evening, March 12, 1907, and was attended by 151 members and guests. The usual informal reception was held at 6 o'clock, and the dinner was served at 7 o'clock.

The special guests of the Society were Prof. Frederic R. Hutton, president American Society of Mechanical Engineers; Hon. William Berwin, acting mayor of the City of Boston; Hon. William A. Morse; Mr. Charles F. Knowlton, president Massachusetts Highway Association; Prof. Lucian I. Blake; and Mr. Charles Moore of the Submarine Signal Company. Music was furnished by the Albion Quartet.

At the conclusion of the dinner the President of the Society, Mr. Frank W. Hodgdon, introduced as the first speaker Professor Hutton, who brought the greetings of the American Society of Mechanical Engineers and spoke very interestingly of the new Engineers' Building in

New York City which had been erected through the munificent gift of Mr. Andrew Carnegie. Mr. Morse in an entertaining speech deplored the amount of accusation and ridicule that is now-a-days flung at anybody who has achieved prosperity or prominence. He particularly deplored the tendency to cast reproach upon the legislature of Massachusetts, which he believed at the present day is as good as it ever was, and better than most. Alderman Berwin brought the congratulations of the City of Boston and regretted that his Honor the Mayor was unable to be present. Mr. Charles F. Knowlton spoke particularly of the work of the Highway Association and of the great assistance which the civil engineer was to all who were engaged in the construction of streets.

An interesting incident of the dinner was a report made by Mr. F. P. Stearns of a call made that afternoon on Mr. Henry Manley, who was prevented from attending the dinner because of a slight indisposition. Mr. Stearns said that Mr. Manley for twenty-five successive years had been the Society's committee to arrange the annual dinner, and that on this anniversary it had occurred to some members of the Society to show their appreciation of his services by making him a slight gift. A gold watch and chain had been procured from voluntary contributions from such of the members as could be conveniently reached, and this afternoon the pleasing duty had been assigned him of presenting this gift to Mr. Manley. In accepting the gift Mr. Manley expressed his deep appreciation for the kind remembrance from the members of the Society and would at a later date try to express his feelings in fitting terms.

BOSTON, MARCH 20, 1907. — The annual meeting of the Boston Society of Civil Engineers was held at Chipman Hall, Tremont Temple, at 7.50 o'clock P.M., President Frank W. Hodgdon in the chair, 60 members and visitors present. The record of the last meeting was read and approved.

Messrs. Edward Hutchins and Charles F. Knowlton were elected members of the Society.

The President read an invitation extended to this Society by the trustees of the United Engineering Society to participate, through an authorized representative, at the dedication of the building given by Mr. Andrew Carnegie as a home for American Engineering Societies, in New York City, on April 16 and 17, 1907.

On motion of Mr. A. H. French the invitation was accepted and the incoming president was requested to represent the Society at the dedication exercises.

The Secretary read the annual report of the Board of Government and, on motion, it was accepted and placed on file.

The Secretary read his annual report and, on motion, it was accepted and placed on file.

The Treasurer read his annual report and, on motion, it was accepted and placed on file.

Mr. Street presented and read the annual report of the Committee on Excursions. On motion, the report was accepted and placed on file.

The Librarian read the annual report of the Committee on the Library and, on motion, it was accepted and placed on file.

Mr. Johnson presented and read the annual report of the Committee on Advertisements. On motion, it was accepted and placed on file.

Mr. E. W. Howe made a verbal report for the Committee on Quarters.

On motion of Mr. F. P. Stearns the recommendation of the Committee on the Library in relation to the circulation of the books in the Society's library was referred to the Board of Government with full powers.

It was also voted, on motion of Mr. Stearns, to appropriate the sum of \$50 for the purchase of standard engineering books.

On motion of Mr. F. L. Fuller it was voted to refer to the Board of Government, with full powers, the appointment of the several special committees of the Society.

President Hodgdon then addressed the Society, giving a very interesting account of some of the difficulties encountered in early surveys of the state of Massachusetts, how they were overcome and the results obtained.

At the conclusion of the President's address the tellers of election, Messrs. Nathan S. Brock and Henry B. Wood, reported the result of the letter ballot and in accordance with their report the following officers were declared elected:

President — Edward W. Howe.

Vice-President (for two years) — Francis W. Dean.

Secretary — S. Everett Tinkham.

Treasurer — William S. Johnson.

Librarian — Frederic I. Winslow.

Director (for two years) — Irving T. Farnham.

Before adjourning the meeting, the President introduced the President-elect, Mr. Howe, who thanked the Society for the great honor conferred upon him.

Adjourned.

S. E. TINKHAM, *Secretary*.

## ANNUAL REPORT OF THE BOARD OF GOVERNMENT FOR THE YEAR

1906-1907.

BOSTON, March 20, 1907.

*To the Members of the Boston Society of Civil Engineers:*

In compliance with the requirements of the constitution, the Board of Government submits its report for the year ending March 20, 1907.

At the last annual meeting the total membership of the Society was 621, of whom 584 were members of the Society, 2 honorary members, 13 associates and 22 were members of the Sanitary Section only.

During the year the Society has lost a total of 20 members; 7 by resignation, 6 by forfeiture for non-payment of dues and 7 have died.

There has been added to the Society during the year a total of 34 members in all grades, 33 by election and 1 transferred from the Toledo Society of Engineers. One of these is an associate and one is a member of the Sanitary Section only.

The present membership of the Society consists of 2 honorary members, 13 associates and 620 members, of whom 20 are members of the Sanitary Section only; making the total membership 635.

The record of deaths during the year is, John J. Howard, died May 18, 1906; Isaac K. Harris, died May 21, 1906; E. Elbert Young, died



June 1, 1906; John E. Cheney, died September 25, 1906; Nelson Spofford, died October 3, 1906, and Freeman C. Coffin, died November 11, 1906. At the time of his death Mr. Coffin was Vice-President of the Society and chairman of the Sanitary Section. William W. Burnham, a member of the Sanitary Section, died August 11, 1906.

Ten regular and one special meetings of the Society have been held during the year, and the Twenty-fifth Annual Dinner was given at the Hotel Vendome on March 12, 1907. The average attendance at the regular meetings was 66, the largest being 106 and the smallest 28. The attendance at the annual dinner was 151.

At the regular meetings the following papers have been read:

March 21, 1906. — Memoir of Dean C. Warren. Address of President John W. Ellis.

April 18, 1906. — Mr. H. A. Miller, "The General Features of the Charles River Basin and Dam." (Illustrated.)

May 16, 1906. — Prof. L. J. Johnson, "Reinforced Concrete Beams." (Illustrated.)

June 20, 1906. — Memoir of William T. Pierce. Prof. F. B. Sanborn, "Fires and their Prevention in Factories." (Illustrated.)

September 19, 1906. — Memoir of E. Elbert Young. General Discussion on Reinforced Concrete Construction.

October 5, 1906. — Continuation of Discussion on Reinforced Concrete Construction.

October 17, 1906. — Mr. Charles Moore, "The Submarine Signal." (Illustrated.)

November 21, 1906. — Mr. F. A. Kummer, "The Development of Wood Pavements." (Illustrated.) Mr. A. L. Plimpton, "Track Work in Washington Street, Boston."

December 19, 1906. — Memoir of Freeman C. Coffin. Mr. Paul Winsor, "Gas Engines and Producer Plants, as used by the Boston Elevated Railway Company."

January 23, 1907. — Mr. H. K. Higgins, "Replacement of Bridges and Allied Structures."

February 20, 1907. — Mr. J. W. Rollins, Jr., "Engineers' Specifications and Contracts from a Contractor's Point of View."

From the report of the Executive Committee of the Sanitary Section it appears that six meetings have been held, with an average attendance of 39. At all of these meetings interesting papers or discussions have been presented, which have been printed in the JOURNAL.

The Society has contributed \$45 towards the rent of the hall, and has paid for the use of the stereopticon and for stenographic reports of the meetings, while the other expenses have been met by members of the Section.

At the beginning of the year the treasury was practically empty. The expenses for the preceding three years had been in excess of the income of the Society, the deficiency having been provided for by the balance carried over from previous years. It was plain that this could not continue, and the Board gave the matter immediate attention.

At the annual meeting it was thought that the only solution was either to curtail the expenses of the Society or to increase the income from advertisements inserted in the JOURNAL. If the expenses were decreased,

it would be necessary to curtail some of the work of the Society, and repeated efforts had already been made to increase the amount of advertising in the JOURNAL, but with little success. The net amount received during the past year was \$198.12, and it was seen that but little could be expected from this source.

A Committee on Advertising was appointed by the Board of Government at the annual meeting, and to this committee is due the solution of the problem. At their suggestion the monthly notice mailed to each member of the Society, announcing the papers which are to be presented at the meetings, together with the names of candidates for membership, has been enlarged into the form of the present monthly bulletin, with which you are all familiar. The results were far in excess of anything which had been anticipated, as, after a few weeks, all the advertisements which could be reasonably used had been secured. The net income from these increased the income of the Society by about \$800, double the amount necessary to provide for the anticipated deficit. The Board fully endorses the concluding portion of the committee's report which is as follows:

"It seemed to the committee, however, that in the *Bulletin* we have something better than an income producer. When the change in the monthly notices was proposed, it was at once evident that here was an opportunity to convey promptly to the membership certain information in regard to the Society and its library which heretofore had been lacking. It was decided to print in the *Bulletin* the records of all meetings, so that these records would be available to the membership much sooner than was possible when they were printed in the JOURNAL, and to make the library more valuable, a list of accessions has been published each month. A beginning has also been made towards publishing reviews of all new books added to the library. Thus has been started a publication which will be of real value and which will bring into closer touch with the Society those members who are not able to attend the meetings. There seems to be no reason why it may not be still further developed to contain, if not all the papers which are to be presented to the Society, at least such of them as can be secured far enough in advance for publication. With the experience of the past year your committee is convinced that this can be done without additional expense to the Society, as the advertising will more than pay the extra cost of publication."

The Board of Government believes that the practice begun some years ago of buying standard engineering books for the Society has proved beneficial, and would recommend that the sum of fifty dollars be appropriated for the purchase of such books for the coming year.

For the Board of Government,

FRANK W. HODGDON, *President*.

ABSTRACT OF THE TREASURER'S AND SECRETARY'S REPORTS FOR THE  
YEAR 1906-1907.

CURRENT FUND.

*Receipts:*

Dues for 1906-1907.....	\$3 935.50
Dues for 1907-1908.....	59.00
Sales of JOURNALS.....	5.50
Rent of rooms.....	1 000.00
Advertisements.....	1 104.00
Library fines.....	2.51
Balance on hand, March 21 1906.....	20.20
	<hr/> \$6 126.71

*Expenditures:*

Rent.....	\$1 995.00
Lighting.....	46.81
Association of Engineering Societies.....	1 472.99
Printing, postage and stationery.....	936.21
Salaries of Secretary, Librarian and Custodian.....	550.00
Reporting meetings.....	163.37
Stereopticon.....	65.00
Annual dinner.....	74.00
Books.....	50.28
Binding.....	29.60
Periodicals.....	30.50
Clerical assistance for Librarian.....	34.00
Furniture and repairs.....	35.40
Incidentals.....	193.91
Loan to Permanent Fund.....	63.95
	<hr/> 5 741.02

Balance on hand, March 20, 1907.....	\$385.69
Due from Permanent Fund.....	63.95

Amount to credit of Current Fund, March 20, 1907.....	\$440.64
Amount to credit of Current Fund, March 21, 1906.....	20.20

Excess of receipts over expenditures during year.....	\$420.44
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PERMANENT FUND.

*Receipts:*

Thirty-two entrance fees, Society.....	\$320.00
One entrance fee, Sanitary Section.....	5.00
Interest on deposits, savings bank.....	269.25
Interest on bond.....	36.00
Interest on deposit, Old Colony Trust Company....	18.64
Subscription to Building Fund.....	100.00
Profits on shares in Co-operative Banks.....	496.05
Loan from Current Fund.....	63.95
Balance on hand, March 21, 1906.....	356.41
	<hr/> \$1 665.30

*Expenditures:*

Merchants' Co-operative Bank, dues on shares.....	\$300.00
Merchants' Co-operative Bank, profits on same.....	118.11
Volunteer Co-operative Bank, dues on shares.....	300.00
Volunteer Co-operative Bank, profits on same.....	196.25
Workingmen's Co-operative Bank, dues on shares...	300.00
Workingmen's Co-operative Bank, profits on same..	181.69
Franklin Savings Bank, deposit.....	42.71
Warren Institution for Savings, deposit.....	43.65
Boston Five Cents Savings Bank, deposit.....	46.11
Provident Institution for Savings, deposit.....	49.44
Eliot Five Cents Savings Bank, deposit.....	44.21
Institution for Savings in Roxbury, deposit.....	43.13
	— — — \$1 665.30

## PROPERTY BELONGING TO THE PERMANENT FUND, MARCH 20, 1907.

Twenty-five shares Merchants' Co-operative Bank.....	\$2 611.94
Twenty-five shares Volunteer Co-operative Bank.....	4 696.75
Twenty-five shares Workingmen's Co-operative Bank.....	4 315.17
Deposit in Franklin Savings' Bank.....	1 252.88
Deposit in Warren Institution for Savings.....	1 280.49
Deposit in Boston Five Cent Savings Bank.....	1 352.47
Deposit in Provident Institution for Savings.....	1 450.12
Deposit in Eliot Five Cents Savings Bank.....	1 297.10
Deposit in Institution for Savings in Roxbury.....	1 265.30
Republican Valley Railroad Bond, par value.....	600.00

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\$20 122.22

Due Current Fund..... 63.95

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Total value of Permanent Fund..... \$20 058.27

Amount of fund as per last annual report..... 18 813.33

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Gain during the year..... \$1 244.04

## TOTAL PROPERTY OF THE SOCIETY IN THE POSSESSION OF THE TREASURER.

Permanent Fund.....	\$20 058.27
Current Fund.....	440.64

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Total..... \$20 507.91

Amount as per last annual report..... 18 833.53

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Increase during year..... \$1 674.38

## REPORT OF COMMITTEE ON EXCURSIONS.

BOSTON, March 20, 1907.

*To the Members of the Boston Society of Civil Engineers:*

The Committee on Excursions herewith respectfully submits its annual report.



Thirteen excursions have been made during the past year, as follows:

April 18, 1906. — Charles River Basin and Dam. Attendance, 42.

May 16, 1906. — Inspection of the Plant of the Boston Bridge Works, East Cambridge. Attendance, 25.

May 24, 1906. — Inspection of Wonderland Park previous to its opening to the public. Attendance, 226.

June 20, 1906. — Lawrence Worsted Mills, Lawrence, Mass. Attendance, 12.

July 25, 1906. — Blake & Knowles Pump Co., East Cambridge, Mass. Attendance, 8.

August 3 and 4, 1906. — Portland Stone Ware Company, Portland, Me. Attendance, 125.

September 1, 1906. — Paragon Park. Attendance, 110.

September 19, 1906. — Sewage Pumping Plant at Deer Island. Attendance, 28.

October 13, 1906. — Simplex Pile Driving, N. Y., N. H. & H. R. R., South Boston. Attendance, 30.

October 17, 1906. — Submarine Signal Company, Boston Harbor. Attendance, 18.

November 21, 1906. — Paving work on Washington Street. Attendance 25.

February 20, 1907. — Pipe Tunnels under Broad Canal, Cambridge. Attendance, 11.

March 20, 1907. — Washington Street Subway. Attendance, 32.

Total attendance, 692; average attendance, 53.

Thirty-six pages of the "New Engineering Work" have been published in the *Monthly Bulletin* of the Society during the past year, as against twenty-four for the previous year.

There is a cash balance of \$9.32 in the hands of the Treasurer.

The Committee wishes to thank all those who have aided in this work.

Respectfully submitted,

L. LEE STREET, *Chairman,*

EUGENE E. PETTEE,

J. O. DEWOLF,

CLARENCE T. FERNALD,

EDMUND M. BLAKE, *Sec'y and Treas.,*

*Committee on Excursions.*

#### REPORT OF THE COMMITTEE ON THE LIBRARY.

BOSTON, MASS., March 20, 1907.

*To the Members of the Boston Society of Civil Engineers:*

The Committee on the Library begs leave to make the following report for 1906-1907.

Since the last annual meeting two hundred and ninety-seven (297) bound volumes have been placed upon the shelves. Of this number fifteen (15) books have been purchased and the remainder have been given to the Society.

During the year Mr. Clemens Herschel presented the Society with seventy (70) volumes. This splendid gift is now upon the shelves of the library and is a valuable addition.

Members have taken from the reading rooms for the purpose of reference two hundred and thirty-two (232) books during the past twelve months. This is an average of nineteen (19) per month, as compared with nineteen (19) per month of last year.

The present rules of the library allow a member to keep a book out five weeks. On account of the demand for some of the standard engineering text-books it seems that this period of five weeks is too long. If this rule is to be continued the Society should have several copies of some of the standard text or reference books in greatest demand, so that members of the Society may be properly accommodated. This solution of the problem, however, would entail considerable expense in the purchase of duplicate books, and a much better way is to reduce the time limit from five weeks to one week or else to limit the use of these standard engineering text-books to the reading rooms only. The committee recommends that the matter be referred to the Board of Government with power.

The committee also recommends that the sum of \$50 be appropriated for the purchase of new reference or text books during the coming year.

Respectfully submitted,

FRANK P. MCKIBBEN, *Librarian*,

FRANK B. SANBORN,

FREDERIC I. WINSLOW,

H. K. BARROWS,

HECTOR J. HUGHES,

*Committee on the Library.*

#### REPORT OF THE COMMITTEE ON ADVERTISEMENTS.

BOSTON, MASS., March 20, 1907.

*To the Members of the Boston Society of Civil Engineers:*

The Committee on Advertisements submits the following report of its doings for the year ending March 20, 1907.

The Treasurer's reports for the past three years have shown an excess of expenditure over income, the excess during the year ending March 21, 1906, being over \$400. The existence of a considerable balance has heretofore prevented a deficit, but at the beginning of the present year the balance had been reduced to \$20.20.

The last annual report of the Treasurer contained the following warning:

"It will be seen from the above that our income has not equalled our expenditure. This was also true of the previous year. The considerable balance on hand at the beginning of the year is now nearly exhausted. . . . It would seem, therefore, that the only practicable method of caring for the deficit is either by increasing the income from advertisements in the JOURNAL or by reducing our current expenses."

It is plain that the expenses, which are practically constant, are capable of very little curtailment without impairing the usefulness of the Society, so that your Advertising Committee realized at the outset the importance of the task before them and that unless their efforts were

successful some way of decreasing the expenditures must be found or the annual assessment be increased.

Repeated efforts had already been made to increase the amount of advertising in the JOURNAL, but these efforts had met with but little success. The net amount received for advertising during the last year was \$198.12. Experience has shown that few advertisers can be brought to see the value of an advertisement in a periodical such as the JOURNAL, which, in many cases, is not removed from the cover, and if removed from the cover is only to be put aside after an inspection of the table of contents.

It seemed to your committee, however, that the Society had a valuable advertising medium in the notices which are sent out each month, containing announcements of the coming meetings and excursions, the list of applications for membership and descriptions of new engineering work. These monthly notices are certain to be opened and read by practically every member of the Society, and advertisements in them are likely to reach a large proportion of the 600 members.

With the consent of the Board of Government the committee made arrangements for inserting a limited number of advertisements in these monthly notices, and the form of the notices was changed to the present *Monthly Bulletin*. The results were far in excess of anything which had been anticipated, and after a few weeks the committee ceased its labors, as it had a sufficient number of advertising contracts to insure a balance in the treasury at the end of the year instead of the threatened deficit, and it did not seem desirable to have too large a volume of advertising matter in the *Bulletin*. The contracts for advertising in the *Bulletin* amount to \$1 120. No commissions have been paid and the only expense has been the extra expense of printing the *Bulletin*, which is in the vicinity of \$300, making a total profit of about \$800 for advertising. No effort has been made to secure additional advertising for the JOURNAL and the only income from this source has been from the renewal of contracts which had been previously made.

The efforts of the committee from a financial standpoint have been successful, and the treasurer's report shows, instead of a deficit of \$400 which we had reason to anticipate, a balance of \$400. It seems to the committee, however, that in the *Bulletin* we have something better than an income producer. When the change in the monthly notices was proposed it was at once evident that here was an opportunity to convey promptly to the membership certain information in regard to the Society and its library which heretofore has been lacking. It was decided to print in the *Bulletin* the records of all meetings, so that these records would be available to the membership much sooner than was possible when they were printed in the JOURNAL; and to make the library more valuable, a list of accessions has been published each month. A beginning has also been made toward publishing reviews of all new books added to the library. Thus has been started a publication which will be of real value and which will bring those members who are not able to attend the meetings in closer touch with the Society. There seems to be no reason why it may not be still further developed to contain, if not all the papers presented to the Society, at least such of them as can be secured for advance publication. With the experience of the past year your committee

is convinced that this can be done without additional expense to the Society, as the advertising will more than pay the extra cost of publication.

Respectfully submitted,

WILLIAM S. JOHNSON,

F. A. BARBOUR,

S. E. TINKHAM,

*Committee.*



## LIBRARY NOTES.

### RECENT ADDITIONS TO THE LIBRARY.

- Andover, Mass., Annual Report, Board of Public Works, 1906.  
 Attleborough, Mass., Annual Report, Water Department,  
 1906.  
 Boston, Annual Reports, City Engineer, 1903-04-05.  
 Boston Annual Reports, Street Department, 1904.  
 Fall River, Mass., Annual Report, Watuppa Water Board,  
 1906.  
 Manchester, Mass., Annual Report, Water Commissioners,  
 1906.  
 New Bedford, Mass., Annual Report, Water Board, 1906.  
 New Jersey, Annual Report, Commissioners of Public Roads,  
 1906.  
 New Orleans, La., Semi-Annual Report, Sewerage and Water  
 Board, 1906.  
 St. Paul, Minn., Annual Report, Board of Public Works,  
 1906.  
 Taunton, Mass., Annual Report, Water Commissioners, 1906.  
 U. S. Interstate Commerce Commission Report for 1906.  
 Coal Miner's Pocket Book.  
 The New Knowledge, Duncan.  
 Valve Gears, C. H. Peabody.  
 Gas and Oil Engine Handbook, S. E. Brooks.  
 San Francisco Earthquake, Schussler.

A number of new books have been starred as it is found that they are so much in demand, especially those on reinforced concrete, that it seems best to retain them in the rooms for a few months, or until the demand for them has diminished. Members are reminded that the library rooms are liable to be locked at noontime, and it would be well for those who wish to enter at that time to procure a key, which costs nothing, as the deposit required for it, 25 cents, will be refunded on its relinquishment.

The following volumes are missing from the library, and no record of them appears on the receipt book :—

- Sewerage of Cities, Baumeister.  
 Cost Data, Gillette.  
 Turbine Practice, Thurso.  
 Reinforced Concrete, Marsh.

Trautwine's Pocketbook, 1905, 2 copies.

Thacher Bars.

Wood Pavements, Kummer.

Railway Economics, Ingoldsby.

Steam Power Plants, Meyer.

Preservation of Metal, Stern.

Law of Operations, J. C. Wait.

Members are requested to give a receipt for each book taken, and those having any of the above books are asked to return them at once.

FREDERIC I. WINSLOW, *Librarian.*

## NEW ENGINEERING WORK.

(Under this head the Excursion Committee proposes to present each month a brief resume of engineering work in progress in New England, as far as such information is readily obtainable. The assistance of members is desired, and items of interest will be gladly received. Such items are intended to include not only works of exceptional magnitude or containing novel features, but also engineering construction work of all kinds and all degrees of magnitude. Notes should be in the hands of the Committee not later than the 2nd Wednesday of each month. The thanks of the Committee are due to the members who have furnished data for the Bulletin.—E. M. BLAKE, Secretary, Excursion Committee, 8 Beacon St., Boston.)

**United States Government.**—*Boston Harbor, 55-foot Channel Improvement.*—The project for this improvement provides for a channel 1,200 feet wide from the Charles and Mystic River Bridges to President Roads, and 1,500 feet wide from President Roads to Broad Sound, 35 feet deep throughout. At the last session of Congress there was appropriated \$1,430,000 for the work, and contracts for \$3,894,000 additional were authorized. Under existing contracts dredging is in progress involving an expenditure of \$2,900,000; 9,780,000 cubic yards are to be removed at prices averaging 22.7 cents per cubic yard in the upper channel, and 39.42 cents per cubic yard in the Broad Sound Channel. These contracts are expected to be completed December 31st of this year, providing a channel 540 feet wide in the upper harbor, 650 feet wide in Broad Sound, and 35 feet deep except where obstructed by ledges not yet removed. Additional contracts for 12,660,000 cubic yards at an estimated cost of \$3,100,000. One contract for the removal of 16,550 cubic yards of ledge at \$16 per cubic yard is in progress and is expected to be completed by June 30th. It is expected shortly to contract for the removal of 16,000 yards additional ledge excavation.

*Fort Point Channel.*—Dredging is in progress involving the removal of 158,000 cubic yards at 28.9 cents per cubic yard, and is expected to be completed by June 30th.

*Dorchester Bay and Neponset River.*—The dredging of the channel will be undertaken under an appropriation of \$125,000 subject to the improvement of the Neponset River above the railroad bridge by the State. The government's work will be done by contract, but will not be commenced until the state authorities assume the improvement of the river above the bridge.

*Mystic River.*—Contracts will be entered into for the removal of 120,000 cubic yards involving an expenditure of about \$40,000.

*Lynn Harbor.*—Dredging is in progress under contract for removal of 646,000 cubic yards at 20.95 cents per cubic yard, and is due to be completed June 30th.

*Beverly Harbor.*—The improvement of the channel will be resumed by dredging and removal of ledges under a recent appropriation of \$38,500. Contracts will be let at an early date.

*Hingham Harbor.*—The channel to the wharves at Hingham will be redredged at an estimated cost of \$10,000 under contract to be let at an early date.

**Commonwealth of Massachusetts.**—METROPOLITAN PARK COMMISSION.—No contracts for the work to be done under the supervision of this Department during the coming year have been let up to the present time, but plans and specifications are being prepared for the work described in the February Bulletin. Bids are to be received on April 15th, for the construction of sea wall and grading and surfacing at Lynn Shore Reservation.

METROPOLITAN WATER AND SEWERAGE BOARD, WATER WORKS.—Work is in progress on an extension of the trunk sewer of the South Metropolitan District.

In Perkins St., West Roxbury, passing Jamaica Pond, a pneumatic tunnel for a 7-foot sewer is being driven about 65 feet below the surface and 35 feet below water surface of the Pond.

On Commonwealth Ave., in Brighton, near the Brookline line, a rock tunnel is being driven for a 6-foot sewer about 40 feet below the surface.

HIGHWAY COMMISSION.—Work is now in progress, on State highways in the following towns:—

Athol.  
Dighton.  
Dudley.  
Lee.  
Lenox,

Manstield.  
Norton,  
Rehoboth.  
Rockport,  
Sterling,

Stockbridge.  
Templeton,  
Westborough.

**HARBOR AND LAND COMMISSION.**—Work on the Anchorage Basin in Boston Harbor, is being prosecuted by two large dredges, each excavating 2,000 yards or more per day.

Another large dredge is engaged in excavating an area near the Commonwealth pier at South Boston, all the above work being to the depth of 30 feet at mean low water.

Two small dredges are also at work, one excavating a channel and yacht anchorage basin at Cottage Park, Winthrop, and the other an anchorage basin for yachts between Savin Hill and Commercial Point, Dorchester.

Work is to be recommenced soon in dredging a channel in Annisquam River, Gloucester, and work will commence in about two weeks in dredging shoals in Ipswich River at Ipswich.

The work of dredging and protecting with riprap the channel and anchorage basin at Nenemsha Inlet at the westerly end of Martha's Vineyard is still in progress.

Work on the concrete sea wall at North Scituate is in progress, and it is expected that work on the granite sea wall in the same locality will be commenced shortly.

Work on the stone breakwater at Cherry Island Bar, Revere, will probably be commenced during this month. This breakwater is to be about 1,400 feet long, to protect an anchorage basin about 900 feet square.

**Charles River Basin Commission.**—*Charles River Dam.*—Work is progressing on the pumps at the lock on the Scherzer Rolling Lift Bridge, described in the March Bulletin, which is now riveted but has no counterweights, and on the outlet to the Boston Marginal Conduit at the dam.

*Boston Marginal Conduit.*—Coleman Bros. are at work on Section 2, between Cambridge St. and Revere St.; and Holbrook, Cabot & Rollins are driving piles and excavating near Back St. The conduit is of concrete with internal dimensions 7 feet 4 inches x 6 feet 8 inches, with overflows at grade 8.50.

**Boston Transit Commission.**—Work is progressing on Washington St. Tunnel entrances, respectively situated at Essex St., at Franklin St. and between the Old South Building and the Old South Meeting House, and on the entrance on Washington and Union Sts. for the station which is to extend from near Hanover St. to Haymarket Sq. It is also progressing on the main tunnel near State St. and on another portion under the Relief Station.

**Boston Elevated Railway.**—ELEVATED AND SUBWAY CONSTRUCTION. — *Sullivan Square.*—Foundations for the steel



structure connecting Sullivan Sq. loop with the new elevated storage yard are now under construction.

*South Approach to Washington St. Tunnel.*—Buildings are being razed preparatory to the construction of foundations for the steel structure connecting present elevated lines at Castle and Washington Sts., with the Washington St. tunnel.

*Forest Hills Extension.* Track system is completed to Townsend St., work now in progress from Townsend St. to Egleston Sq.

DEPARTMENT MOTIVE POWER & ROLLING STOCK.—*Lincoln Power Station.*—The Lincoln power station is being enlarged for two additional units of 2,700 K. W. capacity each. Foundations and in-takes are now under construction by the Hugh Nawn Contracting Co. and are being built with reinforced concrete. Chimney is under construction by Whidden & Co., dimensions being as follows: height, 251 feet 6 inches, base 33 feet by 29 feet, interior diameter of the flue 13 feet, exterior diameter varies from 24 feet 2 inches to 16 feet 2 inches. Steel work is under contract to Lewis Shoemaker & Co. of Philadelphia. Contracts for the balance of the building have not as yet been let.

Engines are to be of the vertical cross compound type rated at 4,000 H. P., furnished by Wm. Todd Co. Boilers of the water tube pattern are rated at 8,000 H. P. Generator 2,700 K. W. capacity furnished by Allis, Chalmers Co.

*Charlestown Power Station* is being enlarged for one additional unit 2,700 K. W. capacity. Entire contract for building extension, foundations and chimney has been awarded Whidden & Co., the foundations, in-take and chimney being now under construction. The engine is to be of the McIntosh & Seymore pattern, 4,000 H. P. Generators G. E. type 2,700 K. W. Condensers and pumps for each unit are furnished by the Warren Steel Pump Company. Boilers to be of the water tube pattern. Balance of equipment has not yet been decided upon.

**Boston & Maine Railroad.**—Steel structure is in course of erection on the Prison Point viaduct. This viaduct crosses the tracks of all the divisions of the Boston & Maine Railroad, and is 1,240 feet in length and 50 feet in width. A draw at Millers River of plate girder and turn-table pattern provides an opening of 36 feet. Viaduct is paved with granite, and has one sidewalk 10 feet wide, a roadway 39 feet wide and provision is made for the addition of another sidewalk in the future. An incline from the westerly side of the viaduct gives access to the freight yard of the Fitchburg Division.

**New York, New Haven & Hartford R. R.**—*The Four-Track Bridge at Neponset.*—The steel work has been completed and will probably be put into service for two tracks within a few days. The trestle approach for two tracks is completed and the other two tracks will soon be completed.

The work on the foundation for the proposed new draw-bridge at Somerset, Mass., has just begun and some temporary work has been installed.

At the Boston Freight Terminal the coal handling plant and pocket is nearly completed and will probably be put into service in three or four weeks.

In addition to this work arrangements are being made to tear down the coal pocket near Dover St., South Boston, which was recently burned, and preparations are being made for the reconstruction of the pocket and machinery as it was before it was burned.

**Fall River Bridge.**—A Joint Board consisting of the Massachusetts Railroad Commissioners, Harbor and Land Commissioners, and the County Commissioners of Bristol County, have awarded the contract for the bridge across the Taunton River, between Fall River and Somerset to the Holbrook, Cabot & Rollins Corporation, and the contractor has begun the construction of the foundations. The bridge is to consist of two spans 100 ft., three spans 200 feet, and a two-leafed Scherzer Rolling Lift draw with a 100 foot clear opening. The bridge is to have a width of 60 feet, and is to be a deck structure with paved roadway. Some of the piers are to go down into very deep water. The contract for the superstructure has been sub-let to the American Bridge Co.

**Rhode Island Stone Bridge Draw.**—The draw for the Rhode Island Stone Bridge at Tiverton, R. I., is now being erected by the Boston Bridge Works. This portion of the bridge consists of a double leafed bascule with two through truss fixed spans arranged so that the counterweight for the bascule travels along the curved top chord of the fixed span. The clear opening of the draw is 100 feet. The fixed spans are in place and the bascule spans are to be erected on end so as to keep the channel open for navigation. Machinery for operating the bridge is under construction at the Boston Bridge Works, and the Lockwood Manufacturing Co.

**Boston & Lockport Block Co. Forge Shop.**—The shop destroyed by fire on Condor St., East Boston, is being rebuilt by the Eastern Expanded Metal Co., and foundations are now being put in place by the Charles R. Gow Co. The foundations consist

of piles formed of 8 inch to 14 inch diameter iron pipe, driven to a hard pan and afterwards cleaned out and filled with concrete. This work is going on in all its stages at the present time.

**Boston.** — **FIRST NATIONAL BANK BUILDING.** — L. P. Soule & Son Co. are beginning the construction of the foundations for the First National Bank Building at the corners of Franklin, Federal and Congress Sts. These foundations are to be of reinforced concrete and provided throughout with a waterproof sheet being far below the water level.

**LOVEJOY'S WHARF.** — An unusually heavy six-story factory building, about 106 feet x 315 feet is being constructed on Lovejoy's Wharf, and concreting of the floors is about to commence. The entire ground area was covered with piles upon which was placed a thick sheet of concrete. The construction consists of brick external walls, with a skeleton of steel columns and girders, the space between the girders to be filled with reinforced concrete beams and slabs. L. P. Soule & Son Co. have the contract, and the steelwork is being manufactured by the New England Structural Co., while the floor construction is to be put in by W. F. Kearns & Co.

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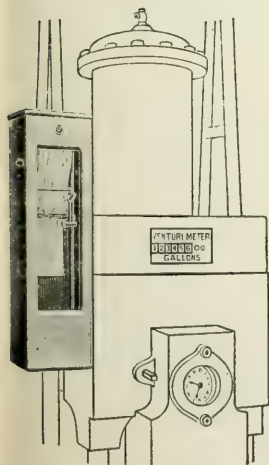
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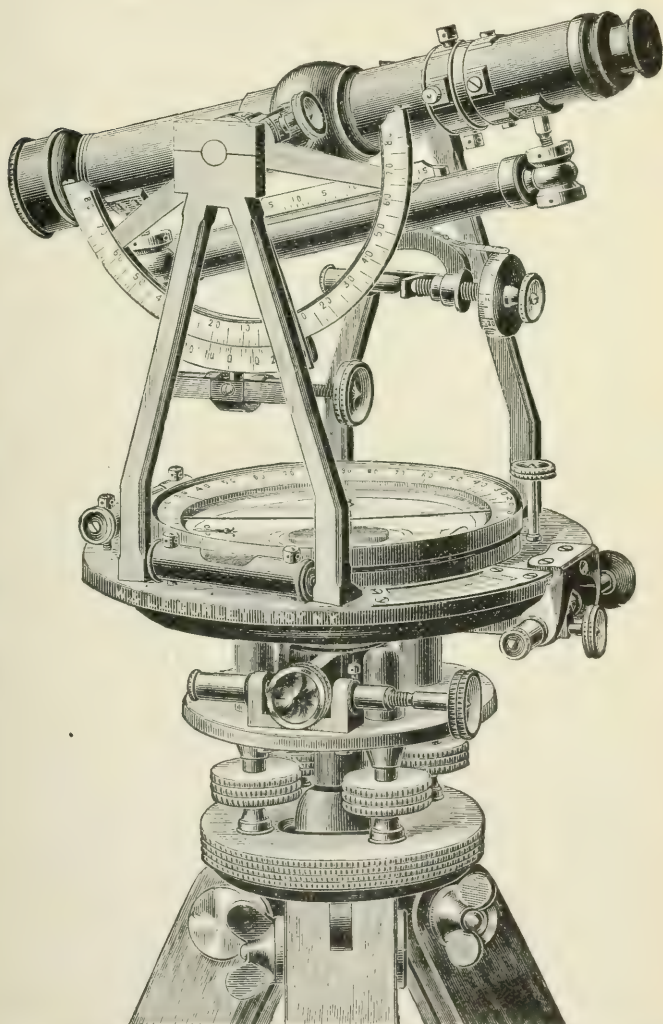
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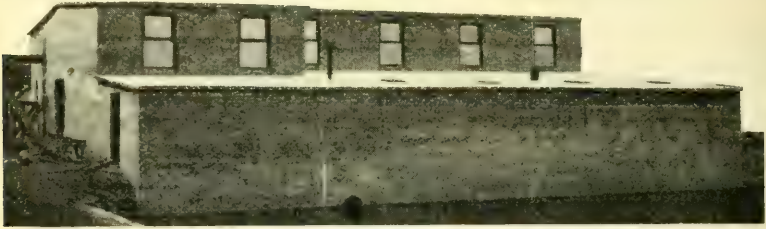
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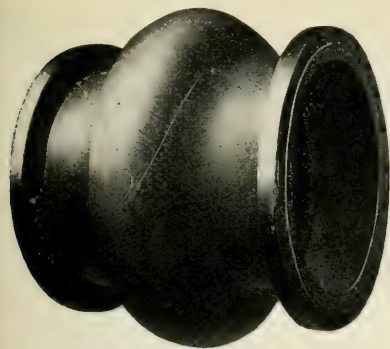
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NEW SERIES.

MAY, 1907.

No. 12.

**REGULAR MEETING.**

A regular meeting of the Boston Society of Civil Engineers will be held on Wednesday, May 15, 1907, at 7.30 o'clock P. M., in

CHIPMAN HALL, TREMONT TEMPLE, BOSTON.

The subject for discussion at this meeting will be Concrete Pile Construction.

Mr. Thomas MacKellar will read a paper on the Simplex System of Concrete Piling.

Mr. Charles R. Gow will read a paper giving his experience with concrete pile construction, with especial reference to Cast Concrete Piles.

The papers will be illustrated by lantern slides.

**BUSINESS OF THE MEETING:** To ballot on the applications for membership as announced in this notice.

S. E. TINKHAM, *Secretary.*

**EXCURSION.**

There will be an excursion on Wednesday afternoon, May 15, to the concrete pile foundation work now under construction at the Milton car barns, Boston Elevated Railway. Take train at the South Station for Milton, leaving at 1.29 P. M. or 2.29 P. M. Trains leave Milton for Boston at 2.11, 3.11 and 4.11 P. M. A member of the Excursion Committee will be on the 1.29 P. M. train. The Milton car barns are within five minutes walk from the station. Members, if they wish, may go by electric by taking any Ashmont and Milton car in the Subway or at Dudley St. The work is described in this Bulletin, and will be discussed by Mr. Charles R. Gow at the evening meeting. If the day is stormy the excursion will be held on the next pleasant day.

**EXCURSION COMMITTEE.**



## CANDIDATES FOR MEMBERSHIP.

To be balloted on at meeting May 15, 1907.

THOMAS FRANCIS BOWLS, Boston, (b. 1869). Attended Haverland Academy until 1886. Canisius College, Buffalo, N. Y., 1886-7 and graduated from Cornell University, College of Civil Engineering, with degree of C. E. in 1891. Employed by City of Newton, Mass., with A. F. Noyes, 1891 to 1894; with B. R. Felton, C. E., Stoneham and Melrose, Mass., Sewerage system in 1895; and from 1895 to date in Sewer Department, City of Boston; since 1900 as District Engineer in charge of Roxbury, South Boston and North Dorchester districts. Recommended by E. S. Dorr, C. R. Cutter, I. T. Farnham and C. H. Dodd.

CHARLES SIDNEY BRYER, Newton, Mass., (b. 1871). Graduated from University of Maine, Class 1897, with degree of B. C. E. In 1899 with N. E. Structural Co., Everett, Mass., as draftsman; 1899 and 1900, with Canso & Louisburg Ry. Co. (Port Hawksbury, N. S.) as instrument man; 1900 to 1902 with City of Boston, Sewer Dept., as draftsman; and since 1902, with Harbor and Land Commission, as instrument man and assistant engineer, now in charge of dredging in Boston Harbor. Recommended by F. W. Hodgdon, F. N. Wales, J. R. Burke, L. H. Bateman and A. L. Kidd.

FRANK ARTHUR LEAVETT, Newton, Mass., (b. 1874). Graduated from Abington High School in June, 1890. From Sept., 1890, until July, 1894, with A. H. French, C. E., as rodman, transitman and inspector on general municipal engineering work; in July, 1894, was appointed assistant engineer and inspector for the Town of Brookline, and has had charge of most of the construction work under the Town Engineer, including Smelt Brook Improvement, \$52,000, Longwood Ave. Bridge, \$115,000, and Boylston St. Improvement, \$25,000. At present is second assistant engineer, Brookline Engineering Department. Recommended by A. H. French, H. A. Varney, H. F. Bryant and F. F. Forbes.

ERNEST MASBRY MOSES, Waltham, Mass., (b. 1876). Graduated from the Lawrence Scientific School with degree of S. B. in civil engineering in 1897. Draftsman with Boston Bridge Works from Aug., 1897, to Sept., 1899; with J. R. Worcester, C. E., from Oct., 1899, to Dec., 1905; since Jan., 1906, with Boston Elevated Railway Co. as draftsman in the Department of Elevated Construction. Recommended by J. C. Moses, E. E. Pettee, J. R. Worcester and L. S. Cowles.

DANIEL SCOULER, JR., Quincy, Mass., (b. 1884). Graduated from Baltimore Manual Training School, 1900. From July, 1900, to March, 1905, draftsman with Fore River Ship Building Co; May, 1905, to June, 1906, draftsman with Philadelphia Rapid Transit Co.; July, 1906, to date, draftsman with Boston Elevated Railway Co., Department of Elevated Construction. Recommended by C. T. Fernald, H. C. Hartwell, G. A. Kimball and L. S. Cowles.

HARRIE LAWRENCE WHITNEY, Beverly, Mass., (b. 1880). Educated at Sawin Academy and Dowse High School, Class '97, at Sherborn, Mass., Burdett College, Boston, 1898, 1899, and at Mass. Institute of Technology,

Class '05. Employed by United Shoe Machinery Co. in Winchester, Mass., 1899-1901; by A. G. Tomasello, contractor at Boston, as an engineer during 1905; Resident Engineer with Sewer Department, City of Beverly, 1905-1907; and on Feb. 1, 1907, was appointed and elected City Engineer of Beverly, Mass. Recommended by C. F. Allen, C. B. Breed, F. H. Fay and C. F. Knowlton.

## APPLICATIONS FOR MEMBERSHIP.

The following applications for membership have been received and are now before the Board of Government for approval. Members having information which will assist the government in its consideration of these applications are requested to communicate at once with any member of the Board. Communications will be regarded as confidential and for the use of the Board alone.

### AS MEMBERS.

JOHN EDWARD CARTY, Boston, (b. 1876). Graduated from Lewis Grammar School, Boston Latin School and Mass. Institute of Technology, taking the civil engineering course at the Institute. With Sewer Department, Boston, as junior engineer from 1897 to 1906 on construction work, and with Engineering Department, Boston, from 1906 to present time as an assistant engineer, junior grade, on office work. Recommended by S. E. Tinkham, S. H. Thorndike, G. W. Hamilton and E. S. Dorr.

ERNEST ROBBINS KIMBALL, Arlington, Mass., (b. 1880). Four years at Lawrence Scientific School, Harvard University, Class 1905. From June, 1905, to Sept., 1905, employed on surveys for New Britain, Conn., water supply; from Sept., 1905, to March, 1906, employed by town of Athol, Mass., in making investigations and plans concerning the value of its water works and testimony in suit; from March, 1906, to May, 1906, employed by town of Framingham in making investigations and plans concerning value of its water works; from May, 1906, to Dec., 1906, with the Boston Elevated Railway Co.; from Dec., 1906, to Jan., 1907, employed by town of Derry, N. H., concerning the value of water works; from Jan., 1907, to March, 1907, viewing engineering works at Panama, San Francisco and Seattle, and at present employed by the Boston Elevated Railway Co. as assistant engineer on construction work at Sullivan Sq., Charlestown. Recommended by P. M. Blake, F. W. Hodgdon, E. M. Blake and L. S. Cowles.

EDWARD FRANCIS MURPHY, Boston, (b. 1870). Graduated from the Scituate High School in June, 1887. Employed as a rodman in the City Surveyor's Department, Boston, from June, 1887, to May, 1891; from May, 1891, to Oct., 1897, as transitman in the Sewer Department, Boston; from Oct., 1897, to Aug., 1900, as assistant engineer in same department; from Aug., 1900, to Feb., 1902, as assistant engineer with the New England Telephone and Telegraph Co. on conduit work, and from Feb., 1902, to present time, district engineer in charge of South Dorchester Sewer Department, Boston. Recommended by E. S. Dorr, F. O. Whitney, G. W. Hamilton and C. H. Dodd.

WILLIAM FRANCIS MAHONEY, Boston, (b. 1873). Graduated from English High School in 1891, and at Lawrence Scientific School, Harvard University during 1893 and 1894; 1892, rodman, Sewer Department, Boston; 1895, assistant engineer, Union Pacific, Denver & Gulf R. R.; 1896, assistant engineer in office of E. L. Rogers, Denver, Col.; 1897, assistant engineer, State Engineer's Office, Denver, Col.; 1898 to 1902, draughtsman, Boston Sewer Department; and 1902 to present time, resident engineer, Stony Brook Improvement. Recommended by E. S. Dorr, C. R. Cutter, G. W. Hamilton and C. H. Dodd.

HENRY THOMAS STIFF, Boston, (1873). Entered the employ of E. L. Brown, C. E., Brockton, in 1891, and the following year accepted a position with the City Engineer of Brockton. In 1899, after a few months with the Boston Elevated Railway Co., entered the employ of the Metropolitan Sewerage Commission, afterwards the Metropolitan Water and Sewerage Board, and is now an assistant engineer on Metropolitan Sewerage Works. Recommended by W. M. Brown, A. H. French, H. L. White and F. A. Barbour.

#### AS AN ASSOCIATE.

JOHN BERNARD GRAHAM, Boston, (b. 1868). Has been engaged in engineering construction for twenty years. Recommended by H. P. Eddy, William Jackson, C. R. Gow and C. H. Dodd.

## MINUTES OF MEETING.

### APRIL MEETING OF THE SOCIETY.

BOSTON, APRIL 17, 1907. -- A regular meeting of the Boston Society of Civil Engineers was held at Chipman Hall, Tremont Temple, at 8 o'clock P.M., President Edward W. Howe in the chair; seventy-six members and visitors present.

The record of the last meeting was read and approved.

Messrs. George H. Brazer and Edward W. Hadcock were elected members of the Society.

The Secretary reported for the Board of Government the appointment of the following committees:

Committee on Excursions — L. Lee Street, E. M. Blake, C. T. Fernald, E. E. Pettee and L. B. Manley.

Committee on the Library — F. I. Winslow, Chas. Saville, N. S. Brock, H. E. Cowan and H. R. Stearns.

Committee on Quarters — Desmond FitzGerald, E. W. Howe, G. A. Kimball, F. W. Dean and F. W. Hodgdon.

Committee on Advertisements — W. S. Johnson, S. E. Tinkham and F. A. Barbour.

Board of Managers, Association of Engineering Societies — S. E. Tinkham, *ex officio*, Dexter Brackett, C. W. Sherman, G. A. Kimball, H. P. Eddy and A. T. Safford.

Mr. Fred. Brooks, for the Committee appointed to prepare a memoir of Nelson Spofford, a member of the Society, presented and read its report.

Mr. George B. Francis read the paper of the evening, entitled "Pennsylvania Terminal Station in New York City, and the Engineering Problems Connected Therewith." The paper was illustrated by a large number of lantern slides.

Adjourned.

S. E. TINKHAM, *Secretary*.

## SPECIAL MEETING OF SANITARY SECTION.

A special meeting of the Sanitary Section was held at the Copley Square Hotel Wednesday evening, May 1, 1907, thirty-eight members being present.

There was a general discussion on the subject of run-off from sewered areas, the methods adopted for securing data and the results accomplished. The discussion was participated in by Messrs. L. M. Hastings, I. T. Farnham, J. H. Kimball, G. A. Carpenter, Leonard Metcalf, R. A. Hale, H. K. Barrows, E. S. Dorr, J. L. Howard and others. Apparatus in use for determining the flow in storm sewers and for recording the intensity of rainfall was described by several of the speakers, and the importance of obtaining accurate data was emphasized by all.

At the conclusion of the discussion, on motion made by Mr. George A. Carpenter, it was voted that a committee of five be appointed by the Chair to consider methods for obtaining reliable facts in regard to rainfall and run-off, to endeavor to interest city officials and others in installing apparatus for this purpose and to collect and collate such records as may be obtained.

The Chairman has appointed as members of this committee Messrs. Irving T. Farnham, Lewis M. Hastings, Hector J. Hughes, George A. Carpenter and Harrison P. Eddy.

## LIBRARY NOTES.

### BOOK REVIEWS.

*Modern Steam Engineering.* By Gardner D. Hiscox. Published by Norman W. Henley Publishing Co., New York. 487 pp., with illustrations.

[Donated by the Publishers.]

This book treats in a general way nearly the entire subject of steam engineering.

The book is illustrated by numerous cuts.

Steam Boilers and Superheaters are treated at some length.

The chapters on Valve Gears are well written and contain many good drawings.

The chapters on Ratio of Cylinder Volumes for Multiple Expansion Engines contain a summary of the rules used by different designers and also the rules given by different writers.



The chapter on Saturated Steam is not particularly valuable; that on Superheated Steam does not represent the best knowledge of the subject today.

General descriptions are given of many of the steam turbines used today; of some of the types of refrigerating machines, of elevators and escalators and of the dynamos.

The book is one from which one may obtain much useful information about steam machinery, and on account of the large amount of ground covered and the numerous illustrations it becomes useful as a reference book.

EDWARD F. MILLER.

*Concrete and Reinforced Concrete Construction.*—By Homer A. Reid, Assistant Engineer, Bureau of Buildings, New York City. Published by the Myron C. Clark Publishing Co., Chicago, Ill.

This work contains 884 pages of copiously illustrated descriptions of concrete construction in all its ramifications. As a book of reference it is very complete, and in arrangement of matter and excellence of typography and illustration it leaves little to be desired. It can hardly be used as a handbook by men with average muscular power on account of its weight and bulk, and to enjoy perusing it one needs an effective book-rest. The author has modestly chosen to fill many of the pages with a compilation of information taken from other sources, often quoting verbatim other writers rather than to use his own words; and this habit is perhaps accountable for the fact that too much is said of the merits and too little of the defects in the designs and methods of design or construction under review. He might have followed the examples of M. Paul Christophe or Professor Baker in describing theories for calculation and then giving the fallacies involved, to the advantage—though undoubtedly sometimes to the disappointment as well—of the reader. It would have been much more instructive, also, if in the description of structures, some of the difficulties and obstacles encountered could have been included.

The book will be found of value by any one who is interested in looking up the manufacture of cement, the machinery used in mixing concrete, how forms are built, or pictures of reinforced concrete structures; but if one wants to obtain a clear, definite rule for proportioning any part of a structure, or material for making a specification for reinforced concrete work, he will be disappointed in the assistance to be obtained from this volume.

J. R. WORCESTER.

## RECENT ADDITIONS TO THE LIBRARY.

- Waltham, Mass., Annual Report Water Department, 1906.  
 Fitchburg, Mass., Annual Report Water Department, 1906.  
 Fitchburg, Mass., Annual Report City Engineer, 1906.  
 Woburn, Mass., Annual Reports for six years back.  
 Wilmington, Del., Annual Report Park Department, 1906.  
 United States Government Irrigation Bulletins; 15 numbers.  
 Cambridge, Mass., Annual Report City Engineer, 1906.  
 Ware, Mass., Annual Report Water Department, 1906.  
 Haverhill, Mass., Annual Report Water Department, 1906.  
 Metropolitan Parks Annual Report, 1906.  
 Indiana Drug Laws, 1906.  
 Springfield, Mass., Annual Report Water Department, 1906.  
 Connecticut State Board of Health, Annual Report, 1887-1906.  
 New Jersey, State Board of Health, Annual Report, 1889-90.  
 Northampton, Mass., Annual Report Water Department, 1906.  
 Wellesley, Mass., Annual Report Water Department, 1906.  
 Experiments Proportioning Concrete, by W. B. Fuller.  
 Tests of Reinforced Concrete Beams, by A. N. Talbot.  
 Clinton, Mass., Annual Report Water Department, 1906.  
 Andover, Mass., Annual Report Board Public Works, 1899.  
 Andover, Mass., Annual Report Water Department, 1890-92.  
 Billerica, Mass., Annual Report Water Department, 1900-06.  
 Middleboro, Mass., Annual Report Water Department, 1906.  
 Newton, Mass., Annual Report Street Department, 1904-06.  
 Newton, Mass., Annual Report City Engineer, 1905.  
 New Bedford, Mass., Annual Report City Engineer, 1905.  
 New Bedford, Mass., Annual Reports Superintendent of  
 Streets, 1902-05.  
 United States Government Interstate Commerce Commission  
 Report, 1906.  
 Boston, Annual Report City Engineer, 1903-05.  
 Transactions Society of Naval Architects; 2 volumes.  
 New York Board of Water Supply Regulations.  
 Philadelphia, Pa., Annual Report Board of Public Works,  
 1905.  
 New Hampshire Annual Reports, Railroad Commission,  
 1904, 05.  
 New Jersey Annual Report Public Roads, 1906.  
 Maine, Annual Report Board of Health, 1905.  
 Michigan, Annual Report Railroad Commission, 1885, 86.  
 New Hampshire, Annual Reports Board of Health, 1883-96.  
 United States Government, Annual Report National Board of  
 Health, 1882.

Massachusetts, Annual Report Highway Commission, 1906.  
 Compressed Air, by Richards.  
 Pattern Making, by Hand.  
 Power Distribution for Electric Railroads, by Bell.  
 Wireless Telegraphy, by Kennelly.

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The Librarian has found it necessary to enforce impartially the rule regarding fines. Members who return books without paying fines will receive a bill for the amount later in the year.

A new section, consisting mainly of railroad reports and old land reports, has been placed upon the upper shelves above Section 10.

Not all the books missing from Section 10 have been returned. Among these are a few valuable ones which must be returned at once.

From time to time there will be placed on the table in the main room duplicate books which the members of the Society are at liberty to retain. These will be plainly stamped "DUPLICATE."

FREDERICK I. WINSLOW, *Librarian.*

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## PERSONAL NEWS.

(Under this heading it is proposed to publish each month personal news relating to members of the Society. All such items of interest should be sent to the Secretary of the Excursion Committee by the first day of each month. The co-operation of members is asked to make this column a success, and they are urged to send in notes even when of a personal nature.—E. M. BLAKE, Secretary, Excursion Committee, 8 Beacon St., Boston.)

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Mr. Alonzo K. Crowell has been elected city engineer of Taunton, Mass.

\* \* \*

Mr. J. J. Kirkpatrick has been elected superintendent of the water works of Holyoke, Mass.

\* \* \*

Mr. Rudolph Hering has been appointed one of the consulting engineers to inspect the recently completed portions of the sewerage system of New Orleans.

\* \* \*

Mr. Nathan C. Grover, late with the United States Geological Survey, has become associated with J. G. White & Co., Inc., as assistant hydraulic engineer under Mr. A. S. Crane, chief hydraulic engineer.

The friends of Mr. Henry Manley will be glad to learn that he is recovering from a serious operation at the Massachusetts Homœopathic Hospital, and is expected to be at his home by the time this Bulletin appears.

\* \* \*

Mr. E. E. Lochridge has been appointed chief engineer in charge of the construction of the new Little River water system for Springfield, Mass. Mr. Allen Hazen is the consulting engineer, and will prepare the final plans for the new system.

\* \* \*

Mr. Allen Hazen recently lectured before the Brooklyn Engineers' Club and the Brooklyn Polytechnic Institute on the water works of Australia, where he spent the past winter in connection with the water supply problem of Brisbane.

\* \* \*

Mr. Greely S. Curtis, fire department and fire alarm expert of the National Board of Fire Underwriters' Committee of Twenty, has opened an office at 17 Battery Pl., New York City, as consulting engineer on fire protective facilities of cities and towns.

\* \* \*

Mr. William S. Johnson, for the past twelve years the assistant engineer of the Massachusetts State Board of Health, has opened an office at 101 Tremont St., Boston, for the practice of civil engineering, making a specialty of sanitary and hydraulic work.

\* \* \*

The firm of Dean & Main, architects and mill engineers, was dissolved early in the present year by mutual consent. Mr. F. W. Dean will retain the offices of the firm at 53 State St., Boston, and will continue the same line of business. Mr. C. T. Main has opened a new office at 45 Milk St., for the purpose of continuing his work in mill engineering, and has associated with him several of the assistants of the old firm.

\* \* \*

Mr. Leonard Metcalf and Mr. Harrison P. Eddy have entered into partnership under the firm name of Metcalf & Eddy, and are located at 14 Beacon Street, Boston. Mr. Metcalf has conducted a consulting engineering business in Boston for the past ten years, along hydraulic and sanitary engineering lines, and Mr. Eddy has been in charge of the sewerage department of the city of Worcester, Mass., for the past fifteen years. The new firm will devote itself particularly to water works, water purification and power, and to sewerage and sewage disposal works.



## NEW ENGINEERING WORK.

(Under this head the Excursion Committee proposes to present each month a brief résumé of engineering work in progress in New England, as far as such information is readily obtainable. The assistance of members is desired, and items of interest will be gladly received. Such items are intended to include not only works of exceptional magnitude or containing novel features, but also engineering construction work of all kinds and all degrees of magnitude. Notes should be in the hands of the Committee not later than the 2nd Wednesday of each month. The thanks of the Committee are due to the members who have furnished data for the Bulletin.—E. M. BLAKE, Secretary, Excursion Committee, 8 Beacon St., Boston.)

**Commonwealth of Massachusetts.**—METROPOLITAN WATER AND SEWERAGE BOARD, WATER WORKS.—Work is progressing on the repairs of the earth slide which occurred on April 11, 1907, at the North Dike of the Wachusett Reservoir, Clinton.

There remains only the floors and one pump foundation to complete the construction of the building which is to be used as a high-service pumping station at Arlington.

METROPOLITAN PARK COMMISSION.—The following is a list of work now in progress under the direction of this department:—

*Lynn Shore Reservation.*—Construction of extension of sea wall from Red Rock to Nahant line, and grading and surfacing of the shore drive from present ending to Nahant line.

*Mystic River Reservation.*—Work of building concrete bridges over the Mystic River Reservation has been resumed, and is very nearly finished.

*Nahant Beach Parkway.*—Construction of a bridle path along the shore from the Nahant Bath House to Nahant, a distance of about a mile and a half, is in progress.

*Quincy Shore Reservation.*—Work of surfacing and finishing the shore drive from Atlantic Street to the National Sailors' home is in progress.

HIGHWAY COMMISSION.—State highways are now under construction in the following cities and towns:—

Acton,	Ipswich,	Palmer,
Athol,	Lee,	Rockport,
Dighton,	Lenox,	Sterling,
Dudley,	Mansfield,	Stockbridge,
Eastham,	Northampton,	Templeton.
Holliston,	Norton,	

CHARLES RIVER BASIN COMMISSION.—Work on the dam is confined chiefly to the Cambridge side, where concrete and stone work is progressing on the sluices. On the Boston marginal conduit Coleman Bros. are driving piles and constructing the concrete

conduit near Revere Street. South of Clarendon Street Holbrook, Cabot & Rollins are driving foundation piles with a steam hammer.

**Boston Transit Commission.**—WASHINGTON STREET TUNNEL.—It is expected that the following work will be going on about May 15, 1907:—Washington Street between Court Avenue and the northerly side of State Street and also in State Street at the Old State House,—excavation for main tunnel and underpinning buildings. The Washington Street Tunnel passes under the East Boston Tunnel at State Street and at this point the invert will be about 46 feet below the surface of the street. Washington Street in front of Ames Building,—tunnel roof being completed. At Temple Place and Old South Meeting House,—work progressing on station entrances.

**Boston Elevated Railway.**—ELEVATED AND SUBWAY CONSTRUCTION, SULLIVAN SQUARE.—Foundations for the steel structure connecting Sullivan Square loop with the new elevated storage yard are now completed.

*South Approach to Washington Street Tunnel.*—Four (4) buildings have been razed and six (6) more are to be razed preparatory to the construction of foundations for the steel structure connecting present elevated lines at Castle and Washington Streets with the Washington Street Tunnel.

*Forest Hills Extension.*—Track system is completed to Townsend Street; work now in progress from Eggleston Square to Forest Hills Street.

DEPARTMENT MOTIVE POWER AND ROLLING STOCK.—*Lincoln Power Station.*—Work at Lincoln Power Station is progressing, as noted in our last bulletin. Foundations for the steel work are nearly completed.

*Charlestown Power Station.*—Concrete wall foundations and one concrete engine foundation are completed; also portion of the discharge and intake mains as far as the sump well, the balance of the line to be of 54-inch cast iron pipe and is now under construction.

BUREAU OF SURFACE LINES.—The railroad bridge is nearly completed over Saratoga Street, East Boston, and work is under way preparatory to removing tracks from the temporary structure and laying them in their permanent location on the new bridge.

*Summer Street.*—Preparatory work is under way in anticipation of the abolition of the grade crossing at this point. After work is completed traffic will be carried on via Maverick Street to the East Boston Tunnel.

*Dudley Street.*—Changes are made from time to time as construction on the railroad bridge and re-location of underground structure require. It is probable that within two months permanent track can be laid next to the south abutment of the bridge.

*Concrete Pile Work at Milton Car Barn.*—This work calls for the driving of 414 concrete piles ranging in length from  $1\frac{1}{2}$  feet to 40 feet. Piles are cast on the surface in forms, are square in section, 13 inches on a side, and are reinforced with No. 3 Clinton wire cloth.

They are handled by means of guyed derricks and sunk by means of a water jet assisted at times by a drop hammer.

The material through which the piles are driven is composed mostly of a mud deposit semi-fluid in nature.

A 6-inch slab of concrete covering the entire lot is floated on the mud and surrounds the heads of piles to prevent lateral movement of same in the ground.

The work is now about two-thirds completed. The contractor is the Charles R. Gow Company.

*Boston & Albany Railroad.*—*Abolition of Grade Crossing at East Boston.*—Work preparatory to the commencement of abolishing the grade crossing at Summer Street is now going on. The contract for the floors at Prescott, Porter and Saratoga Streets will soon be let. The floors consist of concrete with an asphalt wearing surface. The Saratoga Street floor has an area of about 4,680 square feet.

*Grade Crossing at Reservoir Road.*—Brookline, Mass.

*Newton Highlands Branch.*—The rolling of macadam road and surfacing of sidewalks.

*Clyde Street Pier, East Boston.*—Piles are being driven and super-structure is being built.

*Four Tracking from Natick to South Framingham.*—Rock excavation is under way and bids are being asked for the extension of concrete arch culverts.

*Boston & Maine Railroad.*—Steel structure is in course of erection on the Prison Point viaduct. This viaduct crosses the tracks of all the divisions of the Boston & Maine Railroad, and is 1,240 feet in length and 50 feet in width. A draw at Millers River is now in progress of erection and should be fully completed by the end of the month.

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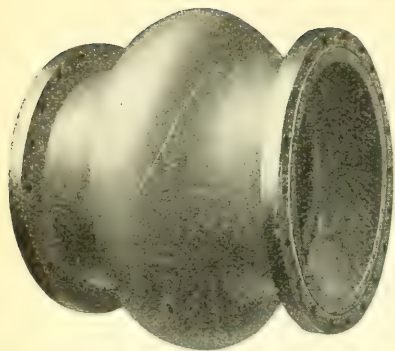
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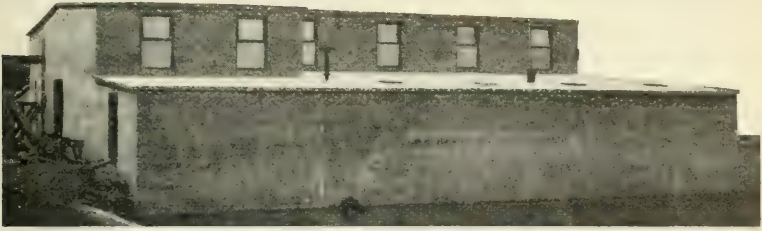
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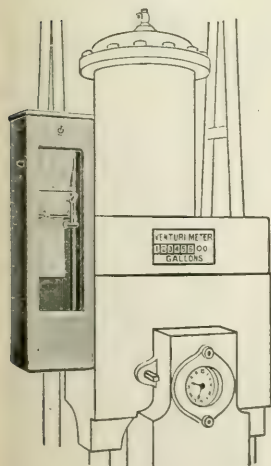
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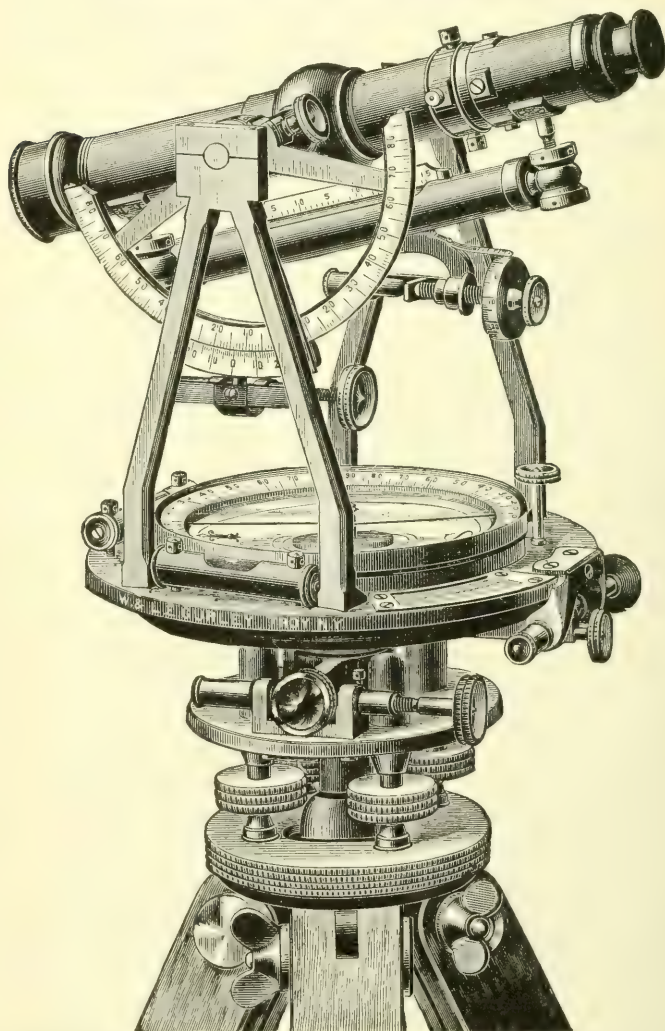
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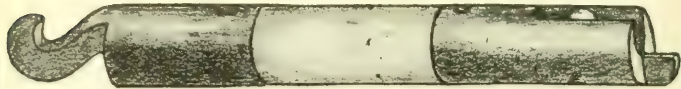
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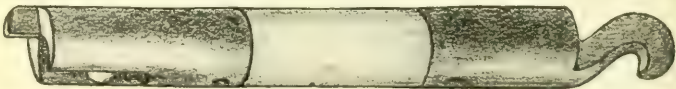
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**Connecticut**—Hartford, Meriden, Naugatuck, New Britain, New London, Norwalk, Rockville, Willimantic.

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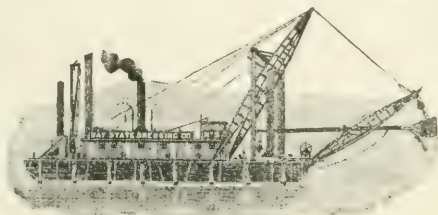
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**BOSTON SOCIETY OF CIVIL ENGINEERS.**  
**ORGANIZED JULY 3, 1848.**

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# MONTHLY BULLETIN.

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NEW SERIES.

JUNE, 1907.

No. 13.

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## REGULAR MEETING.

A regular meeting of the Boston Society of Civil Engineers will be held on Wednesday, June 19, 1907, at 7.30 o'clock P. M., in

CHIPMAN HALL, TREMONT TEMPLE, BOSTON.

Mr. Desmond FitzGerald will exhibit and describe a large number of beautiful colored lantern slides made from photographs taken by him on his travels in various parts of the world.

A most cordial invitation is extended to *ladies* to be present at this meeting.

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BUSINESS OF THE MEETING: To ballot on the applications for membership as announced in this notice.

S. E. TINKHAM, *Secretary*.

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## EXCURSION.

There will be no regular Excursion this month, the Excursion of the Sanitary Section to Providence on Saturday, June 15th, taking the place of the regular Excursion. Notices for this special Excursion to Providence were sent to all members of the Society.



## CANDIDATES FOR MEMBERSHIP.

To be balloted on at meeting June 19, 1907.

### AS MEMBERS.

**JOHN EDWARD CARTY**, Boston, (b. 1876). Graduated from Lewis Grammar School, Boston Latin School and Mass. Institute of Technology, taking the civil engineering course at the Institute. With Sewer Department, Boston, as junior engineer from 1897 to 1906 on construction work, and with Engineering Department, Boston, from 1906 to present time as an assistant engineer, junior grade, on office work. Recommended by S. E. Tinkham, S. H. Thorndike, G. W. Hamilton and E. S. Dorr.

**ERNEST ROBBINS KIMBALL**, Arlington, Mass., (b. 1880). Four years at Lawrence Scientific School, Harvard University, Class 1905. From June, 1905, to Sept., 1905, employed on surveys for New Britain, Conn., water supply; from Sept., 1905, to March, 1906, employed by town of Athol, Mass., in making investigations and plans concerning the value of its water works and testimony in suit; from March, 1906, to May, 1906, employed by town of Framingham in making investigations and plans concerning value of its water works; from May, 1906, to Dec., 1906, with the Boston Elevated Railway Co.; from Dec., 1906, to Jan., 1907, employed by town of Derry, N. H., concerning the value of water works; from Jan., 1907, to March, 1907, viewing engineering works at Panama, San Francisco and Seattle, and at present employed by the Boston Elevated Railway Co. as assistant engineer on construction work at Sullivan Sq., Charlestown. Recommended by P. M. Blake, F. W. Hodgdon, E. M. Blake and L. S. Cowles.

**EDWARD FRANCIS MURPHY**, Boston, (b. 1870). Graduated from the Scituate High School in June, 1887. Employed as a rodman in the City Surveyor's Department, Boston, from June, 1887, to May, 1891; from May, 1891, to Oct., 1897, as transitman in the Sewer Department, Boston; from Oct., 1897, to Aug., 1900, as assistant engineer in same department; from Aug., 1900, to Feb., 1902, as assistant engineer with the New England Telephone and Telegraph Co. on conduit work, and from Feb., 1902, to present time, district engineer in charge of South Dorchester Sewer Department, Boston. Recommended by E. S. Dorr, F. O. Whitney, G. W. Hamilton and C. H. Dodd.

**WILLIAM FRANCIS MAHONEY**, Boston, (b. 1873). Graduated from English High School in 1891, and at Lawrence Scientific School, Harvard University during 1893 and 1894; 1892, rodman, Sewer Department, Boston; 1895, assistant engineer, Union Pacific, Denver & Gulf R R.; 1896, assistant engineer in office of E. L. Rogers, Denver, Col.; 1897, assistant engineer, State Engineer's Office, Denver, Col.; 1898 to 1902, draughtsman, Boston Sewer Department; and 1902 to present time, resident engineer, Stony Brook Improvement. Recommended by E. S. Dorr, C. R. Cutter, G. W. Hamilton and C. H. Dodd.

HENRY THOMAS STIFF, Boston, (b. 1873). Entered the employ of E. L. Brown, C. E., Brockton, in 1891, and the following year accepted a position with the City Engineer of Brockton. In 1899, after a few months with the Boston Elevated Railway Co., entered the employ of the Metropolitan Sewerage Commission, afterwards the Metropolitan Water and Sewerage Board, and is now an assistant engineer on Metropolitan Sewerage Works. Recommended by W. M. Brown, A. H. French, H. L. White and F. A. Barbour.

#### AS AN ASSOCIATE.

JOHN BERNARD GRAHAM, Boston, (b. 1868). Has been engaged in engineering construction for twenty years. Recommended by H. P. Eddy, William Jackson, C. R. Gow and C. H. Dodd.

### APPLICATIONS FOR MEMBERSHIP.

The following applications for membership have been received and are now before the Board of Government for approval. Members having information which will assist the government in its consideration of these applications are requested to communicate at once with any member of the Board. Communications will be regarded as confidential and for the use of the Board alone.

#### AS MEMBERS.

JOHN MICHAEL SHEA, Boston, (b. 1872). Attended National School in Ireland from 1877 to 1887. Evening High School, Boston, from 1891 to 1895, received private instruction from a graduate of the Mass. Institute of Technology, 1901 and 1902. Entered the Sewer Department, Boston, as rodman in 1891, promoted to instrument man in 1894 and to junior assistant engineer in 1898, which position he now holds. Recommended by C. R. Cutter, G. W. Hamilton, E. S. Dorr and C. H. Dodd.

## MINUTES OF MEETING.

### MAY MEETING OF THE SOCIETY.

BOSTON, MAY 15, 1907. - A regular meeting of the Boston Society of Civil Engineers was held at Chipman Hall, Tremont Temple, at 8 o'clock P.M., President Edward W. Howe in the chair, 81 members and visitors present.

The record of the last meeting was read and approved.

Messrs. Thomas F. Bowes, Charles S. Bryer, Frederick A. Leavitt, Ernest M. Moses, Daniel Scouler, Jr., and Harrie L. Whitney were elected members of the Society.

Prof. George F. Swain, for the committee appointed to prepare a memoir of John E. Cheney, a member of the Society, presented and read its report.

The President announced the deaths of Charles H. Haswell, an honorary member of the Society, who died May 12, 1907, and Frank W. Upham, who died May 3, 1907. By vote, the President was requested to appoint committees to prepare suitable memoirs. The following committees were appointed: On memoir of Mr. Haswell, Messrs. Desmond FitzGerald, Clemens Herschel and Ira N. Hollis. On memoir of Mr. Upham, Messrs. I. T. Farnham and Rowland H. Barnes.

Mr. Thomas MacKellar read the first paper of the evening, entitled "The Simplex System of Concrete Piling." Mr. Charles R. Gow read the second paper, which dealt with the general subject of concrete piles. Both papers were illustrated with lantern slides.

In the general discussion which followed the reading of the papers, Mr. Frank B. Gilbreth, in response to an invitation of the President, spoke briefly of his experience in driving concrete piles. He also spoke of the large amount of concrete work now being done at San Francisco, and expressed his regrets that so much of it was in the hands of men who were inexperienced in this kind of work.

Adjourned.

S. E. TINKHAM, *Secretary.*

## LIBRARY NOTES.

### BOOK REVIEWS.

*The Disposal of Municipal Refuse.* By H. de B. Parsons, Consulting Engineer, New York City. Published by John Wiley & Sons, New York.

To the author's training and experience as a mechanical engineer he has added the experience gained in a study of the subject of city wastes disposal made in connection with the design of certain works for the disposal of some of the wastes of the city of New York; and in this book he presents the results of his observations and the information collected in the course of his investigations.

The book contains 186 pages, including numerous diagrams and illustrations, and treats of the whole subject of the collection and disposal of city wastes and refuse with special reference to American cities. After considering the difficulties met with in collecting waste and refuse in different cities, as affected by various conditions of climate, topography, population and government, the writer presents a classification of city wastes and a description of each, including compilations of the quantities of various classes of refuse collected in several cities both in America and in Europe, and the results of chemical analyses of the different classes of these wastes, affording valuable comparisons of their composition and character. The methods of collection of city

refuse are then taken up, the carts and other necessary receptacles and equipment for collection and transportation are described and illustrated, and the troublesome question of separation of wastes into classes is fully considered.

The various methods of disposal in use or available are then described, the advantages and disadvantages of each being presented. The design and operation of certain plants and appliances, presented for the purpose of illustrating the various methods of disposal, are dealt with in considerable detail with diagrams and illustrations, and figures of cost of installation and operation are presented, including the results of tests of the operation of incinerators and reduction plants made to show their capacity, economy or cost of operation. Much information is also presented relative to the economies obtainable in the disposal of city wastes by the saving of by-products.

The problem of city wastes disposal is and should be, as the writer well says, treated as an engineering problem, though this fact has rarely thus far been fully recognized by municipal authorities, and this book presents a study of the disposal of city wastes from an engineer's point of view. The typography and illustrations are excellent, and brevity and conciseness in the descriptions are not the least of the advantages of this work.

The book will be found of the greatest value to those interested in the subject of the collection and disposal of city wastes and refuse.

X. H. GOODENOUGH.

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#### RECENT ADDITIONS TO THE LIBRARY.

Baltimore, Md., Annual Report Water Department, 1906.

Bangor, Me., Annual Report Water Department, 1906.

Clinton, Mass., Town Report, 1906.

Concord, Mass., Annual Town Reports, 1890-1899; 1903-1906.

Concord, N. H., Annual Report Water Department, 1906.

Danvers, Mass., Annual Reports Water Department, 1894-1898; 1900-1903.

Framingham, Mass., Town Reports, 1889, 1893, 1895, 1898, 1900; 1903-1905.

Gardner, Mass., Annual Reports Water Commissioners, 1903-1906.

Gloucester, Mass., Annual Reports Water Department, 1905, 1906.



- Hartford, Conn., Annual Report Water Department, 1906.  
 Haverhill, Mass., Annual Report City Engineer, 1906.  
 Holyoke, Mass., Annual Report City Engineer, 1906.  
 Madison, Wis., Annual Report Water Department, 1906.  
 Manchester, N. H., Annual Report Water Department, 1906.  
 Marlboro, Mass., Annual Reports Water Commissioners,  
 1894, 1896, 1899, 1900, 1902, 1903.  
 Mass. Railroad Commissioners, Annual Report, 1906.  
 Newton, Mass., Annual Report City Engineer, 1906.  
 New York Railroad Commissioners, Annual Report, 1906; 3  
 volumes.  
 North Attleboro, Mass., Annual Town Reports, 1891-1906.  
 Pittsfield, Mass., Annual Reports Board of Public Works,  
 1893-1896.  
 United States Govt., Chief of Engineers, Annual Report,  
 1906.  
 Waltham, Mass., Annual Report City Engineer, 1906.  
 Westboro, Mass., Town Reports, 1897, 1899, 1900, 1902-1906.  
 Woburn, Mass., Annual Reports Town and City, 1894-1897;  
 1903-1905.  
 Clays of Wisconsin, Heinrich Ries, Ph. D.  
 Dictionary of Electrical Terms, E. J. Houston.  
 Engineering Index, 1906.  
 Modern Steam Engineering, G. D. Hiscox.

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Members will please notice that all indexes and all lists of  
 members of the various engineering societies have been placed in  
 the revolving book-case.

FREDERIC I. WINSLOW, *Librarian.*

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## LIST OF MEMBERS.

### ADDITIONS.

THOMAS F. BOWES . . . . .	30 Tremont St., Boston.
CHARLES S. BRYER . . . . .	6 Orris St., Auburndale, Mass.
FREDERICK A. LEAVITT . . . . .	Town Hall, Brookline, Mass.
ERNEST M. MOSES . . . . .	Boston Elevated Ry., 101 Milk St., Boston.
DANIEL SCOULER, JR. . . . .	Boston Elevated Ry., 101 Milk St., Boston.
HARRIE L. WHITNEY . . . . .	City Engineer, Box 995, Beverly, Mass.

## CHANGES OF ADDRESS.

W. M. FOSTER . . . . . Dummer, Vt.  
 J. A. MOYER, Care Westinghouse, Church, Kerr & Co., 10 Bridge St., N. Y.  
 SIDNEY SMITH . . . . . 5 Summer St., Salem, Mass.

## DEATH.

CHARLES HAYNES HASWELL . . . . . Died May 12, 1907.

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## PERSONAL NEWS.

(Under this heading it is proposed to publish each month personal news relating to members of the Society. All such items of interest should be sent to the Secretary of the Excursion Committee by the first day of each month. The co-operation of members is asked to make this column a success, and they are urged to send in notes even when of a personal nature.—E. M. BLAKE, Secretary, Excursion Committee, 8 Beacon St., Boston.)

Mr. Edmund M. Blake has recently been elected President of the Westford (Mass.) Water Company.

\* \* \*

Prof. Charles G. Hyde has been appointed Director of Sanitation for the People's Water Company of Oakland, Cal.

\* \* \*

Prof. Lewis J. Johnson, Harvard College, will spend his summer vacation in Europe, having sailed at the close of the school year.

\* \* \*

Prof. George F. Swain of the Massachusetts Institute of Technology has recently had conferred upon him the degree of LL. D. by the New York University.

\* \* \*

Mr. Lewis D. Thorpe, who was a partner of the late Freeman C. Coffin and succeeded to his business, has been engaged as engineer for the new Norwood, Mass., sewerage system.

\* \* \*

Prof. Frank P. McKibben has been appointed Professor of Civil Engineering at Lehigh University, in place of Prof. Mansfield Merriman, who has resigned after a record of twenty-eight years' service. Prof. McKibben will assume the duties of his office on September 1st, next.

Examinations will be held on July 5th, at New York and a Chicago, to fill six vacancies in the civil engineer corps of the Navy Department. These examinations will be open to civilian engineers. Complete copies of previous questions, serving to illustrate the general character of the examination, can be found in *Engineering News* of January 27, 1898; January 19, 1899; May 1, 1902 and August 13, 1903.

\* \* \*

On Saturday afternoon, June 8, about 85 members of the outside and inside force from the engineering department of the Boston Elevated Railway, including wives and families, enjoyed a most delightful outing at the charming home of Mr. George A. Kimball, chief engineer. The party went to Arlington in a special car, from Post Office Square, and after various sports and a luncheon on the lawn, returned in a special car.

\* \* \*

Mr. H. K. Barrows, formerly district engineer for New England and New York of the United States Geological Survey, has opened an office at 6 Beacon Street, Boston, for general civil engineering work, particularly in water power, water supply and sewerage. He was connected with the city engineering department of Newton, Mass., and the engineering staff of the Metropolitan Water Works before his association with the Geological Survey.

## NEW ENGINEERING WORK.

(Under this head the Excursion Committee proposes to present each month a brief résumé of engineering work in progress in New England, as far as such information is readily obtainable. The assistance of members is desired, and items of interest will be gladly received. Such items are intended to include not only works of exceptional magnitude or containing novel features, but also engineering construction work of all kinds and all degrees of magnitude. Notes should be in the hands of the Committee not later than the 2nd Wednesday of each month. The thanks of the Committee are due to the members who have furnished data for the Bulletin.—E. M. BLAKE, Secretary, Excursion Committee, 8 Beacon St., Boston.)

**Commonwealth of Massachusetts.** —METROPOLITAN PARK COMMISSION. —The work now in progress under the direction of the Engineering Department is as follows:—

*Lynn Shore Reservation.* —Construction of extension of sea wall from Red Rock to Nahant line, and grading and surfacing of the shore drive from present ending to Nahant line.

*Mystic River Reservation.* —Plans and specifications are practically ready for work of building additional span at Cradock Bridge, boat lock and river walls, Main Street, Medford, being work incidental to construction of dam at this point to maintain a basin at permanent elevation. Plans for concrete bridge for Boston & Maine Railroad, Southern Division, over the park drive near West Medford.

*Quincy Shore Reservation.* —Work of surfacing and finishing shore drive from Atlantic Street to the National Sailors' Home is in progress.

METROPOLITAN WATER AND SEWERAGE BOARD, WATER WORKS. —Work is progressing on repairs of the earth slide which occurred on April 11, 1907, at the North Dike of the Wachusett Reservoir, Clinton.

The building to be used as a high service pumping station at Arlington is being completed.

HIGHWAY COMMISSION. —State highways are now under construction at

Acton,	Holliston,	Rockport,
Amesbury,	Hudson,	Scituate,
Athol,	Ipswich,	Stockbridge,
Chelmsford,	Lee,	Templeton,
Dudley,	Lenox,	Townsend,
Eastham,	Norton,	
Falmouth,	Palmer,	

HARBOR AND LAND COMMISSION. —Dredging in Boston harbor of anchorage basin, Bird Island flats; also for removal of the



western end of Bird Island shoal to a depth of 12 feet at mean low water, to allow free passage to and from Revere Beach ferry landing and the Simpson Dry Docks.

On the south side an area is being dredged opposite the Commonwealth pier and Pier No. 4 of the New York, New Haven and Hartford R. R.; and the Reserved channel on South Boston flats is being dredged to the depth of 20 feet at mean low water to give access to the wharves on the northerly side of South Boston.

At Annisquam River, Gloucester, work is in progress removing a large bowlder, containing over 200 cubic yards, which lies directly in the channel near the Western Avenue bridge.

In Ipswich River, channels are being dredged through three shoals, which obstruct the river.

At Menemsha Inlet, near the westerly end of Martha's Vineyard, work is in progress dredging the channel and protecting the shores and banks with stone riprap. The jetties at the entrance are also to be rebuilt with stone.

At Cherry Island Bar, Revere, a breakwater of 1,000 feet long is being built of heavy granite quarry grout to protect an anchorage for yachts and small boats.

The granite monuments to mark the boundary line between Massachusetts and Connecticut are now being set. These are 12 inches square,  $9\frac{1}{2}$  feet long, firmly set in the ground, the upper portions hammered and lettered with the names of the States. They are set at every highway and railroad crossing and town corner. Smaller bounds are set on all the prominent summits.

Concrete and granite sea-walls are being built on the beaches at Scituate.

**CHARLES RIVER BASIN COMMISSION.**—Work on the Charles River Dam is progressing on the Cambridge side of the sluices which are nearing completion. Masonry work on the wing walls on the up stream side of the dam is in progress. The Boston Marginal Conduit is completed to within 50 feet of Revere Street, and work of dredging and driving piles for sea wall and refilling over the conduit is going on between Revere and Pinckney Streets.

**BOSTON TRANSIT COMMISSION.**—It is expected that the following Washington-Street Tunnel work will be in progress about June 15, 1907: Excavation for main Tunnel and underpinning of buildings, in Washington Street between Court Avenue and the northerly side of State Street and also in State Street at the Old State House; construction of station entrances at the Old South Meeting House, at Temple Place and at Boylston Street.

**Boston Elevated Railway.**—**ELEVATED AND SUBWAY CONSTRUCTION, SULLIVAN SQUARE.**—The steel structure connecting

Sullivan Square loop with the new elevated storage yard is now being erected, and completion of new storage yard will follow between Oak Street and the B. & A. R. R.

*South Approach to Washington-Street Tunnel.*—Buildings are razed preparatory to the erection of the steel structure connecting present elevated lines at Castle and Washington Streets with the Washington-Street Tunnel, and foundations are under construction.

*East Cambridge Extension.*—D. J. Reagan & Co. began demolishing buildings on Brighton Street preparatory to the construction of the foundations.

*Department of Motive Power and Rolling Stock.—Lincoln, Charlestown and Harvard Power Stations.*—The additions to these power stations are being pushed very rapidly, the steel structures are erected and curtain walls begun.

**Boston & Albany Railroad.**—*Clyde-Street Pier, East Boston.*—Piles are being driven, and on the superstructure, which is nearly complete, the planking for roof is being laid.

*Abolition of Grade Crossings at East Boston.*—Ditch walls are being put in at Maverick Street, while grading is being done at Summer, Saratoga and Bennington Streets.

*Grade Crossing at Reservoir Road, Newton Highlands Branch.*—The rolling of macadam road and surfacing of sidewalks are in progress.

*Four-tracking from Natick to South Framingham.*—Earth and rock excavation is in progress. Contracts are let for arch culverts extension and retaining walls.

*Three-tracking on Main Line.*—Contracts have been let for earth and rock excavation and extension of bridge abutment and arch culvert at Charlton and East Greenbush.

*Maple Grove, North Adams Branch.*—Steel viaduct across railroad and river has been completed, and curb is being laid and street is being surfaced.

*Abolition of Grade Crossing at Newton Center, Newton Highlands Branch.*—The granolithic platform has been laid at the passenger station. The floors for the steel bridges at Center Street and Langley Road are nearly completed.

**New York, New Haven & Hartford R. R.** — *Abolition of Grade Crossings at New Bedford* by elevating the track over seven highways, all masonry to be of concrete; retaining walls are now being constructed.

*Abolition of Grade Crossings at Dudley Street:* concrete abutments completed for three-fourths of Norfolk Avenue, Cottage

Street and Dudley Street; steel bridges erected on the first two named.

*Abolition of Grade Crossings at Bourne;* relocation of highway under the tracks and the construction of concrete abutments for double track.

*Boston Freight Terminals.*—The Company have about completed the erection of an electric gantry crane on the Boston Freight Terminals, manufactured by the Shaw Crane Company, and furnished by Messrs. Manning, Maxwell and Moore. It has a span of 55 feet over 2 tracks, and a 30-foot paved driveway. The lifting capacity is 35 tons on the main hoist, and 5 tons on the quick acting auxiliary hoist. Lift of main hook, 25 feet. The length of crane track is 203 feet. Specifications are for main hoist with full load to work at a speed of not less than 10 feet per minute, and auxiliary hoist at 50 feet per minute, both increasing with a decrease of load. Crane under full load to travel on its track at a speed of 200 feet per minute and at greater speed when without load. The electrical apparatus is as furnished by the General Electric Company, voltage 220, alternating current 3 phase 60 cycle. The crane is located on Anchor Street, near C Street, South Boston.

**Watertown.**—*Galen Street Bridge.*—Work was commenced on this bridge May 6th. It is to be of reinforced steel concrete with granite facings of 90 feet span, 10 feet rise and 80 feet in width. Preparations are now being made to excavate for the foundations of the abutments in Charles River.

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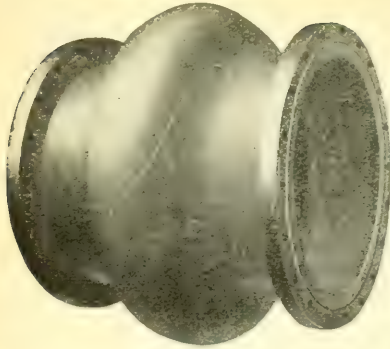
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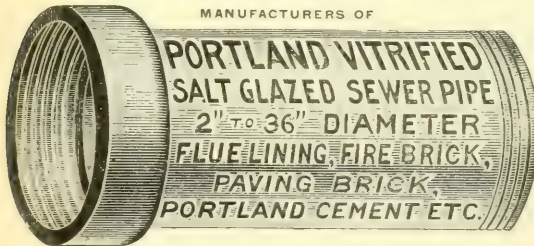
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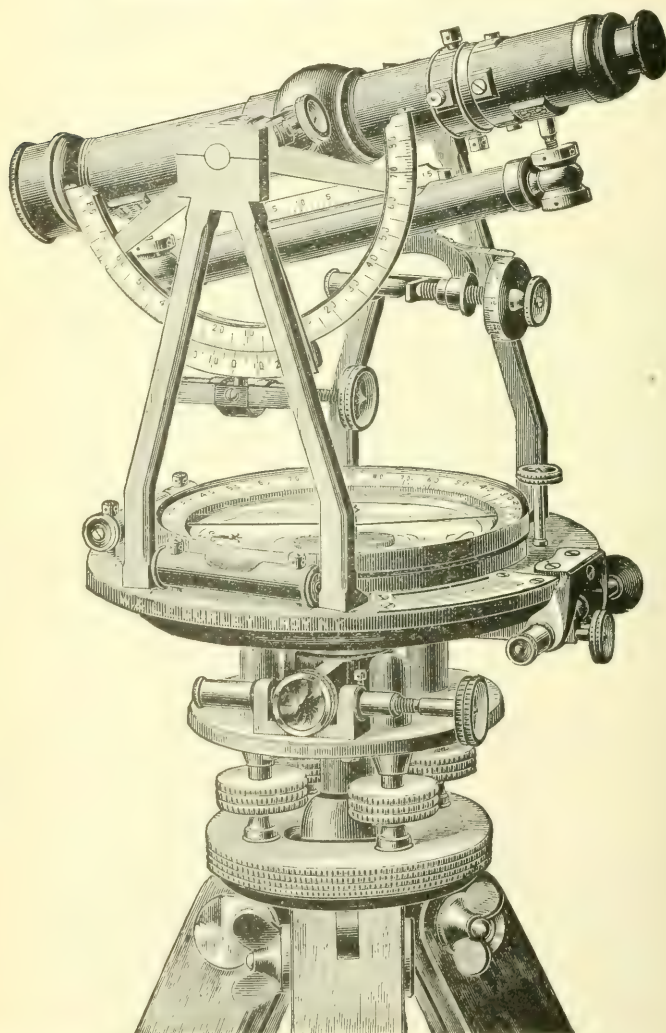
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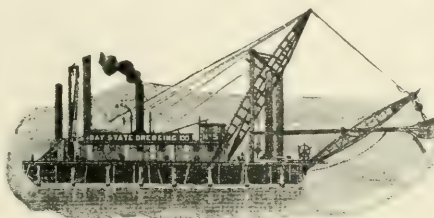
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# MONTHLY BULLETIN.

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NEW SERIES.

SEPTEMBER, 1907.

No. 14.

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## REGULAR MEETING.

A regular meeting of the Boston Society of Civil Engineers will be held on Wednesday, Sept. 18, 1907, at 7.30 o'clock P. M., in

CHIPMAN HALL, TREMONT TEMPLE, BOSTON.

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Mr. Herman K. Higgins, assistant engineer, Gatun Locks Division of Panama Canal, will give an informal talk entitled, "Panama from the Human Side." The lantern will be used and a large number of slides will be shown.

A most cordial invitation is extended to *ladies* to be present at this meeting.

**BUSINESS OF THE MEETING:** To ballot on the application for membership as announced in this notice.

To receive report of Committee on Memoir of Charles H. Haswell.

S. E. TINKHAM, *Secretary*.

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## EXCURSION.

There will be an excursion on Wednesday, Sept. 18, to Cambridge, Mass., to witness the work of laying the Hassam pavement now being done by the Simpson Brothers Corporation.

This work is in progress on Massachusetts Avenue, between Porter Station, North Cambridge, and the Arlington line.



Members and friends will meet at 2 p. m. at Porter Station, and will be taken over the line by representatives of the corporation.

The Hassam pavement now being laid by Simpson Brothers Corporation in Somerville and Cambridge is rather a new departure in street pavements. It is a monolithic pavement formed by filling the roadway with crushed stone thoroughly rolled and then grouted with Portland cement until all the voids are filled. The pavement is laid and grouted in two layers and compacted by a steam roller before the initial set of the cement. The thickness when completed is 6 inches. Expansion joints of pitch are provided along the curb line.

## EXCURSION COMMITTEE.

---

### CANDIDATE FOR MEMBERSHIP.

To be balloted on at meeting September 18, 1907.

#### AS MEMBER.

JOHN MICHAEL SHEA, Boston, (b. 1872). Attended National School in Ireland from 1877 to 1887, Evening High School, Boston, from 1891 to 1895, received private instruction from a graduate of the Mass. Institute of Technology, 1901 and 1902. Entered the Sewer Department, Boston, as rodman in 1891, promoted to instrument man in 1894 and to junior assistant engineer in 1898, which position he now holds. Recommended by C. R. Cutter, G. W. Hamilton, E. S. Dorr and C. H. Dodd.

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### APPLICATIONS FOR MEMBERSHIP.

The following applications for membership have been received and are now before the Board of Government for approval. Members having information which will assist the government in its consideration of these applications are requested to communicate at once with any member of the Board. Communications will be regarded as confidential and for the use of the Board alone.

#### AS MEMBERS.

RALPH WHITE LOUD, East Braintree, Mass., (b. 1876). Educated in public schools of Weymouth, Mass., and graduated from Massachusetts Institute of Technology in 1899. Employed during intervals between school terms, from 1894 to 1898; by the Engineering Department, Town of Brookline, as rodman and instrument man; and since June, 1899, with Metropolitan Sewerage Works as draftsman and engineering assistant in office. Promoted to assistant engineer, junior grade, in August, 1904. Recommended by W. M. Brown, A. H. French, H. A. Varney and H. F. Bryant.

ROBERT AMBROSE VESPER, Boston, (b. 1878). Finished High School course in 1897 and started in civil engineering work the same year in office of E. W. Bowditch; in 1899 employed by Boston Transit Commission; 1900 employed by Paving Division, Boston; about May, 1901, was employed by Boston and Worcester Street Railway Co., and remained with that company until road was finished; fall of 1902 was employed by Massachusetts Highway Commission and is still with that commission. Has acted in the capacity of rodman, transitman and head of party, and is now a resident engineer in charge of construction of state roads. Received a diploma in Surveying and Mapping course in 1903 from International Correspondence School, and graduated from the School of Industrial Foreman (M. I. T.) in spring of 1906. Recommended by J. C. S. Taber, F. O. Whitney, A. B. Fletcher and A. M. Lovis.

FREDERIC JAMES WOOD, Foxboro, Mass., (b. 1867). Special student Massachusetts Institute of Technology, class of 1888. Topographer, draftsman, instrument man and assistant engineer on Northern Pacific Railway in Montana and bridge designer on Great Northern Railway, 1889-93; engineer and manager, Snow's Falls Manufacturing Co., Snow's Falls, Mo., 1893-99; in charge of locations for Willimantic Street Railway Co., September, October and November, 1899; in engineering department American Thread Co., Willimantic, Conn., 1900, 1901; chief engineer, Willimantic Traction Co., location, construction and maintenance, 1902-04; Inspector for School House Commission, Boston, 1904; and since 1904 chief engineer, Boston and Providence Interurban Elevated Railroad Co. Member American Society of Civil Engineers. Recommended by H. S. Adams, F. W. Hodgdon, F. E. Tupper and H. B. Wood.

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## MINUTES OF MEETING.

### JUNE MEETING OF THE SOCIETY.

BOSTON, JUNE 19, 1907.—A regular meeting of the Boston Society of Civil Engineers was held at Chipman Hall, Tremont Temple, at 8 o'clock p. m., President E. W. Howe in the chair. Seventy-eight members and visitors present, including ladies.

The record of the last meeting was read and approved.

Messrs. John E. Carty, Ernest R. Kimball, Edward F. Murphy, William F. Mahoney and Henry T. Stiff were elected members of the Society, and Mr. John B. Graham an associate of the Society.

The literary exercises were furnished by Mr. Desmond Fitzgerald, past President of the Society, who exhibited and described a large number of very beautiful colored lantern slides made from photographs taken by him in his travels in various parts of the world.

Adjourned.

S. E. TINKHAM, *Secretary.*

## LIST OF MEMBERS.

## ADDITIONS.

JOHN E. CAREY . . . . .	60 City Hall, Boston.
JOHN B. GRAHAM . . . . .	25 Eden St., Charlestown.
ERNEST R. KIMBALL . . . . .	336 Mystic St., Arlington.
WILLIAM F. MAHONEY . . . . .	26 Tufts St., Charlestown.
EDWARD F. MURPHY . . . . .	19 Frederika St., Dorchester.
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J. WILLIAM LINK . . . . .	Massena, N. Y.
FRANK P. MCKIBBEN . . . . .	Lehigh University, So. Bethlehem, Pa.
LEMUEL POPE . . . . .	Hudner Block, Fall River, Mass.
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G. EDWARD SLEEPER . . . . .	Mansfield, Mass.
CHARLES E. WELLS . . . . .	Mitchell, Neb.
RALPH WHITMAN . . . . .	U. S. Navy Yard, League Island, Pa.
ANDREW W. WOODMAN . . . . .	909 Stock Exchange Building, Chicago, Ill.

## DEATH.

ALFRED E. NICHOLS . . . . .	Died July 31, 1907.
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## LIBRARY NOTES.

## BOOK REVIEWS.

*A Text-Book of Topographical Drawing* (Technical Drawing Series). By Frank T. Daniels, A. M. B. 144 pages.  $7\frac{1}{2} \times 5\frac{3}{4}$  inches; many illustrations. Boston: D. C. Heath & Co., 1907.

[Donated by the author.]

This little book is one of the few really good text-books in drawing and the only one on topographical drawing which it has ever been the reviewer's fortune to see. Some years ago, when he was teaching this subject, there were only two or three text-books available, and those were large, expensive and not very

satisfactory. Such a book as this would have been of great value to him at that time.

The present book seems eminently satisfactory in every way. It is small, of convenient shape and size for drawing-room use, and yet contains all that can properly be given in a course in topographical drawing. The explanations are clear and logical. In particular the explanations of the use of the brush in representing topography by colors are decidedly the best that the writer has ever seen in print.

The chapter headings are :— Introductory ; Preliminary Problems and Operations ; Plotting ; Topographical Drawing in Ink ; Topographical Drawing in Colors ; Surface Forms and Earthworks ; Conventional Treatment for Surfaces and Sections ; Copying, Reduction and Enlargement of Plans.

The book is designed for use by students, and contains many exercises and problems.

CHARLES W. SHERMAN.

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#### RECENT ADDITIONS TO THE LIBRARY.

Brookline Playgrounds, D. Fitzgerald.

United States Water Supply and Irrigation Bulletins, 182-183-196.

United States Geological Survey Bulletins, 279-297-300-303.

Montreal, Can., Harbor Commissioners' Reports, 1894, 1900, 1901-05.

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Massachusetts Railroad Commissioners' Report, 1906.

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 Woburn, Mass., Annual Report of Public Works, 1906.  
 Woburn, Mass., Annual Report of Water Department, 1906.  
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 Medford, Mass., Annual Report of Water and Sewer Com-  
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 Manchester, N. H., Annual Report Water Commissioners, 1903.  
 Fitchburg, Mass., Annual Report Water Commissioners, 1905.  
 Detroit, Mich., Annual Report Water Commissioners, 1901,  
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 Newark, N. J., Annual Report Street and Water Commis-  
 sioners, 1904-06.  
 New Orleans, La., Annual Report Sewerage and Water Board,  
 1906.  
 New Bedford, Mass., Annual Report Superintendent of  
 Streets, 1906.  
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 Cincinnati, O., Annual Report Water Department, 1906.  
 Boston, Mass., Annual Report Water Commissioners, 1903-05.

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The Proceedings of the American Society of Civil Engineers has been bound in volumes separate from the Transactions so far as obtainable and covering the following years:—1879-86 ; 1896-1906.

FREDERIC I. WINSLOW, *Librarian*.

## PERSONAL NEWS.

(Under this heading it is proposed to publish each month personal news relating to members of the Society. All such items of interest should be sent to the Secretary of the Excursion Committee by the first day of each month. The co-operation of members is asked to make this column a success, and they are urged to send in notes even when of a personal nature.—E. M. BLAKE, Secretary, Excursion Committee, 8 Beacon St., Boston.)

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Dr. Rudolph Hering has been retained by the City of Milwaukee to recommend a method of disposal for the garbage of that city.

\* \* \*

Mr. Ralph Whitman has been appointed assistant civil engineer, United States Navy, and assigned for duty at the League Island Navy Yard.

\* \* \*

Mr. John R. Freeman has been retained by the New York Water Supply Commission to direct the investigation of the water power resources of the state.

\* \* \*

Mr. John R. Burke, for ten years assistant engineer of the Massachusetts Board of Harbor and Land Commissioners, resigned in the early summer to engage in contracting for dredging and river and harbor improvements.

\* \* \*

Mr. William T. Blunt has resigned as superintendent for G. H. Breyman and Brothers, contractors of Boston. Previous to his connection with that firm Mr. Blunt was United States civil engineer in charge of river and harbor work, etc., over the western end of Lake Erie.

\* \* \*

Messrs. Metcalf and Eddy have been retained to assist the Finance Commission of the City of Boston in the investigation of the Water and Sewer Departments. They are also acting under Mr. Whinery of New York City to investigate the Street, Street Cleaning and Watering, and the Sanitary Departments.

## NEW ENGINEERING WORK.

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(Under this head the Excursion Committee proposes to present each month a brief résumé of engineering work in progress in New England, as far as such information is readily obtainable. The assistance of members is desired, and items of interest will be gladly received. Such items are intended to include not only works of exceptional magnitude or containing novel features, but also engineering construction work of all kinds and all degrees of magnitude. Notes should be in the hands of the Committee not later than the 2nd Wednesday of each month. The thanks of the Committee are due to the members who have furnished data for the Bulletin.— E. M. BLAKE, Secretary, Excursion Committee, 8 Beacon St., Boston.)

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**United States Government.**— *Boston Harbor.*— Proposals were opened on June 29, 1907, for dredging to complete the 35-foot channel improvement, Boston Harbor, and contract has been entered into with G. H. Breymann & Bros. of Toledo, Ohio, the lowest bidders, on all four divisions, for dredging 9,770,000 cubic yards in the Upper Main Ship Channel at 22 cents a cubic yard; and 2,440,000 cubic yards in Broad Sound Channel at 40 cents a cubic yard. The contract amounts to \$3,125,400 and is to be completed on or before Dec. 31, 1911.

Proposals were opened June 25, 1907, for removing ledge from 35-foot channel, Boston Harbor, and contract has been entered into with G. H. Breymann & Bros. of Toledo, Ohio, the lowest bidders, for removing approximately 15,000 cubic yards at \$21.74 per cubic yard. The contract amounts to \$326,100, and is to be completed on or before Dec. 31, 1908.

Proposals were opened June 15, 1907, for building a riprap seawall at Fort Heath, Winthrop, Mass., and contract has been entered into with John Cashman of Quincy, Mass., the lowest bidder, for building 300 feet of seawall at a total cost of about \$9,000; to be completed on or before Dec. 15, 1907.

Proposals were opened Aug. 20, 1907, for dredging in Weymouth Back River, Mass., and contract has been entered into with Simon J. Donovan of East Boston, Mass., the low bidder, for dredging, including the removal of bowlders, in an amount of about \$9,500; 33 cents per cubic yard covering dredging and removing bowlders less than 3 tons in weight, and \$10 per cubic yard for removing bowlders weighing 3 tons or more; to be completed on or before Nov. 30, 1907.

Proposals were opened April 22, 1907, for building a wharf at Deer Island, Boston Harbor, Mass., and contract was made with W. H. Ellis, East Boston, Mass., the lowest bidder, for construction of an approach to the wharf 136 feet long, 16 feet wide, connecting the pier head 33 feet by 81 feet with the shore at a total cost of about \$6,500.



*Beverly, Mass.*—Proposals were opened May 25, 1907, for dredging in Beverly Harbor, Mass., and contract has been made with Bay State Dredging Co. of Boston, Mass., the lowest bidder, at the rate of 38½ cents per cubic yard of material measured in scows, and \$5 per cubic yard for the removal of bowlders weighing 3 tons or more each. The contract amounts to about \$16,000, and is to be completed on or before Nov. 30, 1908.

**Commonwealth of Massachusetts.**—**METROPOLITAN PARK COMMISSION.**—*Lyon Fells Parkway.*—The construction of the portion from Middlesex Fells Reservation to Green Street, Melrose.

*Lyon Shore Reservation.*—The construction of extension of concrete seawall from Red Rock to the Nahant line, and grading and surfacing of the shore drive from present ending to the Nahant line.

*Middlesex Fells Parkway.*—The construction of extension of Parkway from its junction with Forest Street to Elm Street, and the construction of roadbed for electric railway through Middlesex Fells Reservation.

*Mystic River Reservation.*—The construction of a dam, boat lock, river walls and additional span to Cradock Bridge, Main Street, Medford, and other work incidental to the maintenance of a permanent water level in the Mystic River above Cradock Bridge.

The construction of concrete bridge for the Southern Division of the Boston & Maine Railroad over the park drive along Mystic River near West Medford.

*Quincy Shore Reservation.*—The work of surfacing and finishing shore drive from Atlantic Street to National Sailors' Home.

**CHARLES RIVER BASIN COMMISSION.**—At the dam, concrete work is going on at the lock and sluices, which are nearly completed. The Scherzer rolling lift bridge is nearly completed and equipped.

The Boston Elevated Railway Company has started excavation below the dam for piers for their new bridge.

The Boston Marginal conduit is completed nearly to Mt. Vernon Street. Between that point and Berkeley Street work of filling in earth is in progress. About 300 feet of seawall on the embankment has been built with exception of coping.

**HARBOR AND LAND COMMISSION.**—The improvement of Menemsha inlet by building stone jetties and dredging channel and anchorage basin is still in progress.

The work of enlarging the stone jetties at Cuttyhunk will be commenced early in the month. The appropriation for this work is \$5,000.

The dredging of the westerly end of Bird Island Shoal in Boston Harbor is still in progress.

The improvement of Scorton Harbor at East Sandwich by dredging a new outlet and protecting the same with a stone jetty has been commenced. The appropriation for this work is \$10,000.

The dredging of Annisquam River has been nearly completed, so that boats can pass from Gloucester Harbor to Annisquam at low tide. The building of a retaining-wall and cleaning up of a few shoal spots is still in progress.

The work of building a breakwater at Revere is well advanced; it will probably be completed this month.

The work of strengthening the riprap on the bank of the Connecticut River at Hadley will be commenced shortly. The work of quarrying the stone from a ledge on the bank of the river at North Hadley is now in progress. The appropriation for this work is \$8,000.

**Boston Transit Commission.**—It is expected that the following Washington-Street tunnel work will be in progress about September 15, 1907: Construction of main tunnel in Washington Street between Court Avenue and the northerly side of State Street and in State Street at the Old State House; construction of station entrances at Water Street, at Summer Street, at Winter Street, at Hayward Place and at Boylston Street; construction of station stairways from entrances and exits on Washington and Union Streets to the platforms near Haymarket Square; also covering with tile finish the walls and part of ceilings of stations from LaGrange Street to Boylston Street, and from Temple Place to Winter Street.

**Boston Elevated Railway.**—ELEVATED AND SUBWAY CONSTRUCTION.—*Sullivan Square.*—The steel structure completing the new elevated storage yard is erected, and columns supporting the structure under the concrete floor are being fire-proofed.

*Forest Hills Extension.*—Track work is completed to the end of the structure as erected, and the steel work for the new Egleston Square Station, furnished by the New England Structural Co., is in process of erection.

*South Approach to Washington-Street Tunnel.*—A stone abutment is being erected on the northerly side of the Boston & Albany location near Washington Street to carry elevated steel structure. A reinforced concrete incline is being constructed at the junction of Oak and Ash Streets, and various modifications and remodeling of buildings are being made along this line. The erection of steel work will probably commence the latter part of this month.

**DEPARTMENT MOTIVE POWER AND ROLLING STOCK.**—*Lincoln, Charlestown and Harvard Power Stations.*—The additions to these power stations is well under way. Machinery is being installed at both the Lincoln and Charlestown power stations.

**BUREAU OF SURFACE LINES.**—*Fellsbury Extension.*—Work has been commenced on the extension of the surface lines from Sullivan Square to the Stoneham line and is now in progress at Mystic Avenue, Somerville.

*Dudley Street Grade Crossing.*—Both surface tracks are now in their final locations, and cars are being operated under the new railroad bridge.

*East Boston.*—Saratoga Street temporary bridge has been removed and the East Boston tunnel cars are now operated over the permanent bridge built by the Boston & Albany Railroad.

**Boston & Albany Railroad.**—*Clyde Street Pier, East Boston.*—The new Pier on the site of the old Cunard Pier is practically completed. It is 180 feet by 600 feet.

*Abolition of Grade Crossings at East Boston.*—Work is in progress on concrete abutments at Summer Street. A 30 inch concrete drain is also being laid.

*Beacon Park Engine House.*—Contract is about to be awarded for a new 20 stall round house and new power house at Beacon Park, Allston. The round house will have concrete foundations and the walls will be of reinforced concrete.

*Four-tracking from Lake-crossing to South Framingham.*—Steam shovel work and track laying is being done by the railroad forces. Concrete is being laid at bridge 36. This is the extension of 10 feet span arch at Lake Cochituate. New work is reinforced concrete on pile foundation. Work will start at once on a new tower at Natick.

*Three-tracking on Main Line.*—Work of three-tracking is in progress at Charlton, Middlefield, Richmond, Richmond Furnace, Canaan, East Chatham and Brookview. This work involves about 60,000 cubic yards earth excavation, 20,000 cubic yards rock excavation, the extension of about 40 culverts all of new work to be concrete and remodelling of three bridge abutments.

*Pittsfield and North Adams Junction Engine House.*—Contract will be awarded at once for new 8 stall rectangular engine house 60x180 feet and new shop building.

*Cady's Crossing, East Chatham, N. Y.*—Work of grading for new street approaches in connection with abolition of grade crossing is being done. New concrete abutments will be built.

**Boston and Maine Railroad.**— *Work at Belmont, Mass.*—

Separation of grades by elevating the tracks of the Central Massachusetts and Fitchburg Divisions of the Boston & Maine R. R. and depressing the grades of Concord Avenue and Leonard Street. The track will be carried over the highway by a masonry arch 65 feet 6 inch span, 8 feet 6 inch rise. One new station will replace the two now used.

*At Rowley, Mass.*, the state highway is to be carried over the Eastern Division by a reinforced concrete arch 44 feet span, 12 feet rise.

*Newburyport at High Street* the single track tunnel is being replaced by a plate girder bridge with concrete floor with span to accommodate these tracks.

*At Dover, N. H.*, the single track tunnel is to be replaced by a double track tunnel in connection with double track work from Newmarket to Dover.

**City of Boston.**—ENGINEERING DEPARTMENT.— *Northern Avenue Bridge.*—The entire masonry substructure is complete. The Boston approach is being paved from Atlantic Avenue to the abutment. Work on the steel superstructure by the New England Structural Co. is in progress as follows: Span 1 (through truss), falsework in place and erection begun; span 3 (plate girder), about to be erected from lighters; span 2 and the draw span (both through trusses), in the shops.

*Atlantic Avenue Bridge.*—Regularly opened for travel on August 12. The draw is turned by electricity, and the ends raised by levers operated by compressed air.

**Waltham, Mass.**—Extension of water supply at South Street, Waltham, near the Weston line. A large area of muck and loam is being cleaned out, a temporary well has been built, previous to the erection of a large pump well in the centre of the site. This well will be 30 feet in diameter and about 25 feet deep. A pumping station, with boiler house and coal pockets is to be erected this summer, all of reinforced concrete construction. The Aberthaw Construction Co. are the contractors.

**Cambridge, Mass.**—Simpson Brothers Corporation is laying about 20,000 square yards Hassam pavement on Massachusetts Avenue, between Porter Square and the Arlington line.

**Somerville, Mass.**—Simpson Brothers Corporation is laying about 17,000 square yards Hassam pavement on Highland Avenue, Medford Street, Cross Street and Broadway.



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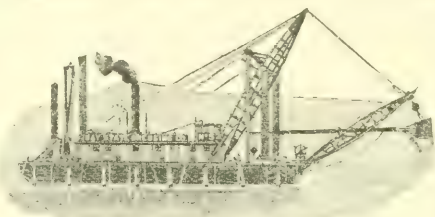
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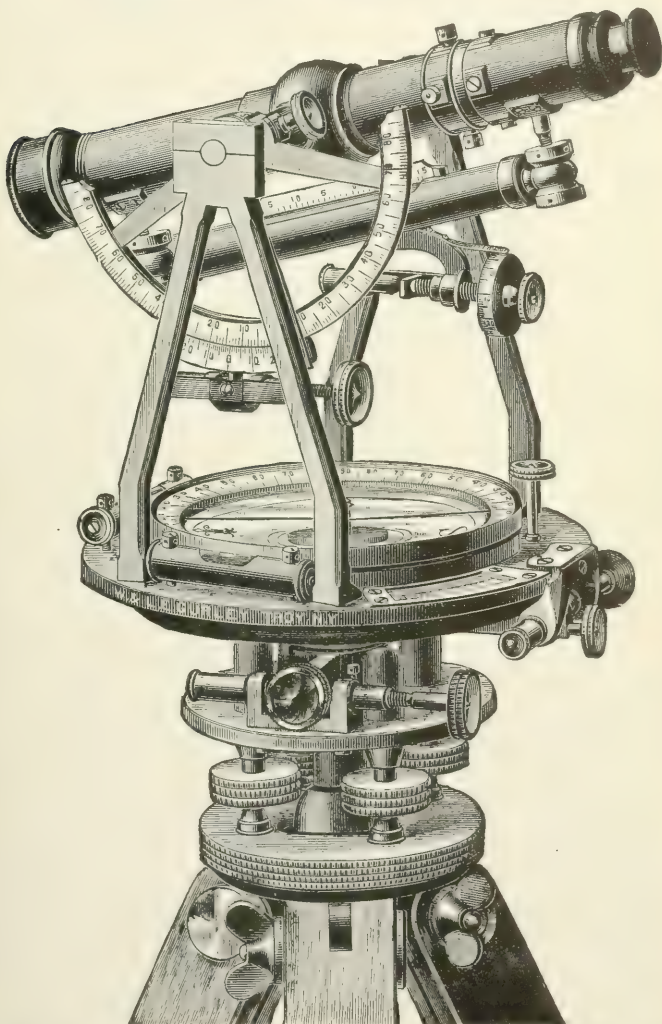
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**BOSTON SOCIETY OF CIVIL ENGINEERS.**

**ORGANIZED JULY 3, 1848.**

# MONTHLY BULLETIN.

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NEW SERIES.

OCTOBER, 1907.

No. 15.

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## REGULAR MEETING.

A regular meeting of the Boston Society of Civil Engineers will be held on Wednesday, Oct. 16, 1907, at 7.30 o'clock P. M., in

CHIPMAN HALL, TREMONT TEMPLE, BOSTON.

Mr. Edward W. De Knight of New York, Manager, Hydrex Felt and Engineering Co., will read a paper on "Waterproof Engineering." The paper will be illustrated by lantern slides.

**BUSINESS OF THE MEETING:** To ballot on the applications for membership as announced in this notice.

S. E. TINKHAM, *Secretary.*

## EXCURSION.

There will be an Excursion on Saturday, October 19, to the Observatory on Blue Hill to inspect the apparatus and methods used in weather observations. An exhibition of kite flying is promised if weather permits.

Members will meet at 2 P. M. at Dudley Street Transfer Station, upper level, where cars will be taken to the foot of the hill.

EXCURSION COMMITTEE.



## CANDIDATES FOR MEMBERSHIP.

To be balloted on at meeting Oct. 16, 1907.

### AS MEMBERS.

**RALPH WHITE LOUD**, East Braintree, Mass., (b. 1876). Educated in public schools of Weymouth, Mass., and graduated from Massachusetts Institute of Technology in 1899. Employed during intervals between school terms, from 1894 to 1898; by the Engineering Department, Town of Brookline, as rodman and instrument man; and since June, 1899, with Metropolitan Sewerage Works as draftsman and engineering assistant in office. Promoted to assistant engineer, junior grade, in August, 1904. Recommended by W. M. Brown, A. H. French, H. A. Varney and H. F. Bryant.

**ROBERT AMBROSE VESPER**, Boston, (b. 1878). Finished High School course in 1897 and started in civil engineering work the same year in office of E. W. Bowditch; in 1899 employed by Boston Transit Commission; 1900 employed by Paving Division, Boston; about May, 1901, was employed by Boston and Worcester Street Railway Co., and remained with that company until road was finished; fall of 1902 was employed by Massachusetts Highway Commission and is still with that commission. Has acted in the capacity of rodman, transitman and head of party, and is now a resident engineer in charge of construction of state roads. Received a diploma in Surveying and Mapping course in 1903 from International Correspondence School, and graduated from the School of Industrial Foreman (M. I. T.) in spring of 1906. Recommended by J. C. S. Taber, F. O. Whitney, A. B. Fletcher and A. M. Lovis.

**FREDERIC JAMES WOOD**, Foxboro, Mass., (b. 1867). Special student Massachusetts Institute of Technology, class of 1888. Topographer, draftsman, instrument man and assistant engineer on Northern Pacific Railway in Montana and bridge designer on Great Northern Railway, 1889-93; engineer and manager, Snow's Falls Manufacturing Co., Snow's Falls, Mo., 1893-99; in charge of locations for Willimantic Street Railway Co., September, October and November, 1899; in engineering department American Thread Co., Willimantic, Conn., 1900, 1901; chief engineer, Willimantic Traction Co., location, construction and maintenance, 1902-04; Inspector for School House Commission, Boston, 1904; and since 1904 chief engineer, Boston and Providence Interurban Elevated Railroad Co. Member American Society of Civil Engineers. Recommended by H. S. Adams, F. W. Hodgdon, F. E. Tupper and H. B. Wood.

## APPLICATIONS FOR MEMBERSHIP.

The following applications for membership have been received and are now before the Board of Government for approval. Members having information which will assist the government in its consideration of these applications are requested to communicate

at once with any member of the Board. Communications will be regarded as confidential and for the use of the Board alone.

#### AS MEMBERS.

**JULIUS W. BUGBEE**, Providence, R. I., (b. 1870). Graduated from Worcester Polytechnic Institute, Class of 1890. Chemist, Nashua Iron and Steel Co., 1890-92; chemist, Worcester Sewage Purification Works, 1892-1901; superintendent and chemist, Providence Sewage Precipitation Tanks, 1901 to date. Recommended by H. P. Eddy, J. A. McKenna, F. B. Bourne and F. O. Gage.

**JOSEPH HENRY O'BRIEN**, Yonkers, N. Y., (b. 1874). From March, 1891, to January, 1897, with W. G. Preston, architect, Boston, as student, draftsman and superintendent; January, 1897, to November, 1899, with Boston Terminal Co. as draftsman, designer and inspector; February, 1900, to March, 1902, with Rhode Island Suburban Railway Co., Providence, as assistant engineer in charge of construction; March, 1902, to November, 1902, with N. Y. C. & H. R. R. R. as assistant engineer in charge of design, Grand Central Terminal Improvements; November, 1902, to date, with Westinghouse, Church, Kerr & Co., New York City, as resident engineer, P. R. R. New York Terminal. Recommended by G. B. Francis, E. J. Beugler, A. B. Corthell and J. R. Worcester.

#### LIST OF MEMBERS.

##### ADDITIONS.

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## MINUTES OF MEETING.

### SEPTEMBER MEETING OF THE SOCIETY.

Boston, SEPT. 18, 1907.—A regular meeting of the Boston Society of Civil Engineers was held at Chipman Hall, Tremont Temple, at 7.50 o'clock P. M. President E. W. Howe in the chair. Ninety-one members and visitors present, including ladies.

The record of the last meeting was read and approved.

\* Mr. John M. Shea was elected a member of the Society.

The President announced the death of Alfred E. Nichols, a member of the Society, who died July 31, 1907, and on motion the President was requested to appoint a committee to prepare a memoir. The President has appointed as that committee Messrs. George A. Nelson and Arthur T. Safford.

Mr. Desmond FitzGerald, for the committee appointed to prepare a memoir of Charles H. Haswell, an honorary member of the Society, presented and read its report.

The Secretary read, in the absence of either member of the committee, a memoir of Frank W. Upham, a member of the Society, prepared by Messrs. Irving T. Farnham and Rowland H. Barnes.

On motion of the Secretary, the thanks of the Society were voted to Mr. John J. Leahy, Superintendent of Sewers of Boston, for his courtesy in placing the City boat "Cormorant" at the disposal of the Society on the occasion of the excursion down the harbor on August 22nd.

The thanks of the Society were also voted to Simpson Brothers Corporation for courtesies shown to members this afternoon at the inspection of the Hassam pavement in Cambridge.

Mr. Herman K. Higgins then gave a very interesting informal talk entitled "Panama from the Human Side." A large number of lantern slides were thrown on the screen, showing not only the work now under way for the excavation of the Canal, but the life and scenery at the Isthmus.

Mr. F. P. Stearns, with the aid of diagrams, showed the progress that had been made month by month in the amount of material excavated from the Canal.

Adjourned.

S. E. TINKHAM, *Secretary*.

## LIBRARY NOTES.

### BOOK REVIEWS.

*Clean Water and How to Get It.* By Allen Hazen. Large 12 mo., VI + 178 pages, New York. John Wiley & Sons.

[Donated by the author.]

This little book of 174 pages, just published, should soon outrun its first edition. The subject is an interesting one, the eve of its advent most opportune, and few men are better fitted to talk

on clean water than Hazen, who has done so much himself with his own hands and brains to clean our water supplies. "Clean Water" was written on a voyage to the other side of the globe in the interests of Brisbane and is dated from the Pacific Ocean. It does not require much effort of the imagination to see the pages, still wet with ink, dropping like leaves upon the stateroom floor as the steamship ploughed the main.

"Clean Water" may be read through in a couple of evenings if one is saturated with the subject. If not, it may require more time for thought. It does not pretend to be too deeply technical, in fact, as stated in the preface, it is more for beginners than members of water boards and water works superintendents. There is a note of becoming modesty in this, for, judging from the writer's long experience with members of water boards, many of them will be glad of the help of this easily understood volume.

But let us take a glance at its contents. Here in the opening we have a description of impounding reservoirs—or storage reservoirs as they are more properly called in this country. In this chapter some of the principles embodying the construction of these surface supplies are lightly touched upon, and examples given with photographic illustrations. In this chapter we have a brief resumé of such questions as "Stagnation," "Odors and Tastes," "Stripping" and "Color."

In the second chapter is a discussion of water supplies from small lakes, covering only a couple of pages, then follows "Supplies from the Great Lakes," represented by such cities as Chicago, Cleveland, Buffalo, Detroit, Milwaukee and Duluth, and of course with all of these the problem of "Contamination" is more or less involved.

Chapter IV embraces "Water Supplies from Rivers," and here the sanitary aspects become all important. We may not agree entirely with Mr. Hazen's complaisance at a little impurity in the water, perhaps it is for the fun of getting it out! But we must not linger too long over such small matters or we shall never reach the end of this review.

Now comes "Ground Water Supplies," bless them! What an endless source of vexation of spirit! yet Mr. Hazen enters the lists valiantly and finishes up the whole bunch in sixteen pages, including that heart-rending subject "Iron in Ground Waters," and here in the same chapter comes "Sea Water in Ground Water Supplies." It is indeed a comfort to be told that "the admixture of even a small proportion of sea water renders the water \* \* \* \* undesirable for domestic use"; this may seem funny to the lay reader,



but the writer recalls distinctly in his own practice several cases where sea water in tangible quantities was admitted to the distribution systems.

The chapter on "Development of Water Purification in America" is, as we may easily anticipate, most faithfully and strikingly outlined, first, with a little bit of historical foreground; and then with "Experiments," "Tastes and Odors," and "Methods of Coagulation" for a middle distance, touched up with a general view of Washington Filters and an interior view of a covered filter; while a "Partial List of Places in the United States Where Filters are at Present in Use or Under Construction" fills the background.

Following this important subject comes a chapter "On the Nature of the Methods of Purifying Water," including Mechanical Separation, Coagulation, Chemical Purification, Aeration, etc., etc.

Chapter IX is "On the Application of the Methods of Water Purification, Arranged According to the Matters to be Removed by the Treatment," and is intimately connected with the previous chapter. In another edition we trust Mr. Hazen will introduce a series of cross references so as to connect several of the matters necessarily widely separated in this valuable treatise, as for instance, the question of the action of Iron in Ground Water, page 53, and that of Iron in Surface Supplies, page 100, and of Iron Removal, page 107. It is interesting to compare the resemblances and differences at the same reading.

In chapter XI "On the Required Sizes of Filters and Other Parts of Water Works" we think Mr. Hazen has departed somewhat from his plan to make a book for beginners only, and this leads us to hope that in subsequent editions Mr. Hazen may decide to make a more extensive blend for the use of water works superintendents and others who are obliged to absorb the various problems connected with water supply from a semi-technical point of view.

The chapters on "Fire Protection and the Waste of Water" are filled with solid and valuable advice. We should have said that Mr. Hazen had more than given full value for the price of his book if it had ended here, but when the financial aspects of water supply are discussed and American and European conditions compared, the value of pure water and meters and unnecessary expenditures are dispassionately pointed out and a digest of financial management added, we can only close our too brief review with the hope that everyone interested will get a copy, and that we may be enabled soon to read this useful little book all over again.

## RECENT ADDITIONS TO THE LIBRARY.

- Chemistry of Commerce, R. K. Duncan.  
 Origine de la Statique, R. Duhem.  
 The Churches and Modern Thought, Philip Vivian. (Gift of Mr. Clemens Herschel.)  
 Toronto, Ont., Annual Report of City Engineer, 1906.  
 New York State Engineer's Report, 1905.  
 Wilmington, Del., Annual Report Water Commissioners, 1906.  
 Middletown, Conn., Annual Report Water Commissioners, 1906.  
 Somerville, Mass., Annual Reports City Engineer, 1894, 1895, 1897-99; 1902-06.  
 Somerville, Mass., Annual City Report, 1906.  
 Gloucester, Mass., Annual Reports City Engineer, 1904, 1905.  
 Framingham, Mass., Town Reports, 1901-06.  
 Fall River, Mass., Annual Report City Engineer, 1906.  
 Norwood, Mass., Town Reports, 1899, 1904-06.  
 Leominster, Mass., Annual Water Reports, 1889-91; 1893, 1894, 1896, 1900, 1902, 1903, 1906.  
 Natick, Mass., Annual Sewer Reports, 1897-99; 1901, 1902, 1904, 1906.  
 Natick, Mass., Annual Water Reports, 1904, 1905.  
 Melrose, Mass., Annual Report Board of Public Works, 1906.  
 Westfield, Mass., Town Reports, 1875-1906.  
 Waltham, Mass., Annual Reports City Engineer, 1898-1901.  
 Waltham, Mass., Annual Report Water Department, 1904.  
 St. Louis, Mo., Annual Report Water Commissioner, 1904-07.  
 St. Louis, Mo., Report on Water Supply, 1902.  
 Yonkers, N. Y., Annual Report Water Commissioners, 1896-98; 1902-05.  
 Syracuse, N. Y., Annual Report Bureau of Water, 1904-06.  
 New Orleans, La., Semi-annual Report Sewerage and Water Board, 1907.  
 Philadelphia, Pa., Annual Report of Chiefs of Bureaus, 1905.  
 Providence, R. I., Quarterly Reports Department of Public Works, 1901-06.  
 Portland, Me., Annual Report Commissioner of Public Works, 1903-06.  
 St. John, N. B., City Report for 1903.  
 Salem, Mass., Annual Report Water Board, 1904.  
 Taunton, Mass., Annual Report Water Commissioners, 1904.  
 Watertown, Mass., Annual Report Water Department, 1900, 1905, 1906.

FREDERIC I. WINSLOW, *Librarian.*

## PERSONAL NEWS.

(Under this heading it is proposed to publish each month personal news relating to members of the Society. All such items of interest should be sent to the Secretary of the Excursion Committee by the first day of each month. The co-operation of members is asked to make this column a success, and they are urged to send in notes even when of a personal nature.—E. M. BLAKE, Secretary, Excursion Committee, 8 Beacon St., Boston.)

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Dr. Rudolph Hering has been chosen by the Passaic Valley Sewage Commission to prepare plans for a trunk sewer to drain the Passaic Valley.

\* \* \*

Prof. George F. Swain for Vice-President and Mr. Dexter Brackett for Director, are among the nominations for officers of the American Society of Civil Engineers to be elected at the annual meeting in January next, submitted by the nominating committee.

\* \* \*

Mr. Horace Ropes, formerly with the Metropolitan Water Board and later with the New York City Board of Water Supply, has been engaged by the New York State Water Supply Commission to assist Mr. John R. Freeman in the investigation of the water power resources of the state.

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## NEW ENGINEERING WORK.

(Under this head the Excursion Committee proposes to present each month a brief résumé of engineering work in progress in New England, as far as such information is readily obtainable. The assistance of members is desired, and items of interest will be gladly received. Such items are intended to include not only works of exceptional magnitude or containing novel features, but also engineering construction work of all kinds and all degrees of magnitude. Notes should be in the hands of the Committee not later than the 2nd Wednesday of each month. The thanks of the Committee are due to the members who have furnished data for the Bulletin.—E. M. BLAKE, Secretary, Excursion Committee, 8 Beacon St., Boston.)

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**Commonwealth of Massachusetts.**—METROPOLITAN WATER AND SEWERAGE BOARD, SEWERAGE WORKS.—Work is in progress on a variety of contracts on the extension of trunk sewer of the South Metropolitan District in Brookline, between the Roxbury and Brighton lines. Much of the work involves tunnelling in compressed air.

**METROPOLITAN PARK COMMISSION.**—The work now in progress under the direction of the Engineering Department of the Metropolitan Park Commission is as follows:—

*Lynn Fells Parkway.*—The construction of the portion from Middlesex Fells Reservation to Green Street, Melrose.

*Lynn Shore Reservation.*—The construction of extension of concrete sea wall from Red Rock to the Nahant line, and grading and surfacing of the shore drive from present ending to the Nahant line.

*Middlesex Fells Parkway.*—The construction of extension of Parkway from its junction with Forest Street to Elm Street, and the construction of roadbed for electric railway through Middlesex Fells Reservation.

*Mystic River Reservation.*—The construction of a dam, boat lock, river walls and additional span to Cradock Bridge, Main Street, Medford, and other work incidental to the maintenance of a permanent water level in the Mystic River above Cradock Bridge.

The construction of concrete bridge for the Southern Division of the Boston & Maine Railroad over the park drive along Mystic River near West Medford.

*Quincy Shore Reservation.*—The work of surfacing and finishing shore drive from Atlantic Street to National Sailors' Home.

**HIGHWAY COMMISSION.**—State highway work is now under way in the following cities and towns:—

Acton,	Haverhill,	Southbridge,
Barnstable,	Lee,	Sterling,
Becket,	Lenox,	Stockbridge,
Boxboro,	Medford,	Sturbridge,
Canton,	Methuen,	Swansea,
Charlton,	Middleboro,	Taunton,
Chatham,	Northampton,	West Boylston,
Chicopee,	Palmer,	Weymouth,
Dover,	Pittsfield,	Williamstown,
Erving,	Princeton,	Winchendon,
Franklin,	Rehoboth,	Windsor.
Greenfield,	Richmond,	
Hancock,	Southboro,	

A concrete-steel beam bridge, 3 spans of 35 feet each, is being constructed at Groton and Pepperell.

**CHARLES RIVER BASIN COMMISSION.**—At the dam concrete work is going on at the lock and sluices and the erection of lock gate is begun.

The Boston Elevated Railway Company is at work on excavation below the dam for piers for their new bridge.

Work is in progress on the Boston Marginal Conduit, and filling is being placed as far as Dartmouth Street.



**Boston Transit Commission.**—It is expected that the following Washington-Street Tunnel work will be in progress about Oct. 15, 1907: Construction of main Tunnel in Washington Street between Court Avenue and the northerly side of State Street and in State Street at the Old State House; construction of station entrances at Summer Street and at Winter Street; covering with tile finish the walls and part of ceilings of stations between LaGrange Street and Franklin Street; also construction of part of new westerly wall, roof and invert for enlargement of Subway, Haymarket Square.

**Boston Elevated Railway.**—ELEVATED AND SUBWAY CONSTRUCTION, *Sullivan Square.*—The steel structure completing the new elevated storage yard is erected and columns supporting the structure under the concrete floor are being fireproofed.

*Forest Hills Extension.*—Track work is completed to the end of the structure as erected, and the steel work for the new Egleston Square Station, furnished by the New England Structural Co., is in process of erection.

*South Approach to Washington-Street Tunnel.*—A stone abutment on the northerly side of the Boston & Albany location near Washington Street is completed and work is under way on the reinforced concrete pier between the locations of the Boston & Albany and the New Haven roads. On the southerly side of the Albany location the present abutment is being reinforced to carry one of the new posts for the elevated structure. The steel structure beginning at Oak Street is now under erection by the McClintic-Marshall Construction Co. Alterations to the buildings along the line are still under way.

DEPARTMENT MOTIVE POWER AND ROLLING STOCK.—*Lincoln and Charlestown Power Stations.*—The engine at Charlestown and one of the engines at Lincoln Power Station has been turned over slowly with steam.

*Central Power Station.*—Construction under way on a brick intake tunnel 5 feet in diameter, shaft varying in size from 15 feet at the top to 5 feet at the tunnel. This tunnel is at elevation of about minus 30. About 20 feet of tunnel has been built without air compressor, but a compressor plant is being installed at the present time. The work is being done by the Hugh Nawn Contracting Co.

A new chimney is being constructed by the Alphons Custodis Chimney Construction Co., and is made of their patent radial bricks.

BUREAU OF SURFACE LINES.—*Fellsway Extension.*—Work is under way on the Fellsway track from Mystic Avenue, Somer-

ville, to the Arlington bridge. The conduit of four ducts for the cables is being constructed of patent compressed paper tubes, and work is completed from the Revere Beach Parkway to Fulton Street, Medford.

**City of Boston.**—ENGINEERING DEPARTMENT.—*Boylston Street Bridge.*—This bridge, over the Boston & Albany Railroad near Massachusetts Avenue, has been partially closed to travel and is being strengthened by the Boston Bridge Works to carry 50-ton trolley cars. A new truss will be inserted between the existing trusses at each side of the bridge, and new floor beams provided which will be loaded in such a manner that the trolley tracks and adjacent floor will be carried wholly by the new trusses while the rest of the floor is carried by the existing trusses. The Boston Elevated Railway Company will pay for the work.

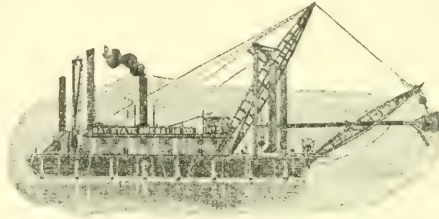
**Boston, Mass.**—The New England Foundation Co. has nearly completed the pile foundation for the 8,000 ton reinforced concrete coal pocket of the Lehigh & Wilkesbarre Coal Co. at the Mystic Docks, Charlestown. The foundation requires about 750 concrete piles, averaging 25 feet in length, which are being installed by the Simplex System of Concrete Piling.

**Cambridge, Mass.**—Three all concrete buildings are being constructed at the corner of Hampshire and Portland Streets, East Cambridge, by Benjamin Fox. The buildings aggregate 900 feet long by 60 feet wide and 4 stories high, giving 216,000 square feet additional floor space for the use of the Boston Woven Hose and Rubber Co.

The buildings are of reinforced concrete throughout — foundations, columns, floor, curtain walls, interior partitions and stairs. Work has been under way now for two months and will be finished in about six weeks more. Over 300 men are employed on the work; the operation is a continuous one, going ahead twenty-four hours per day.

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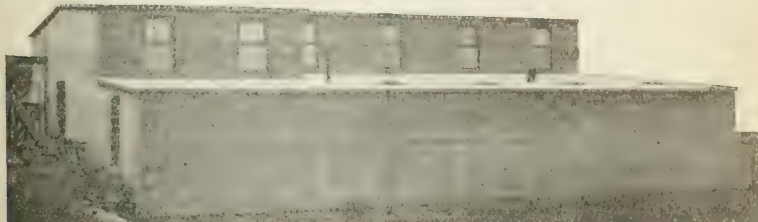
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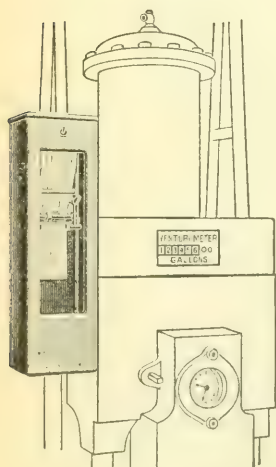
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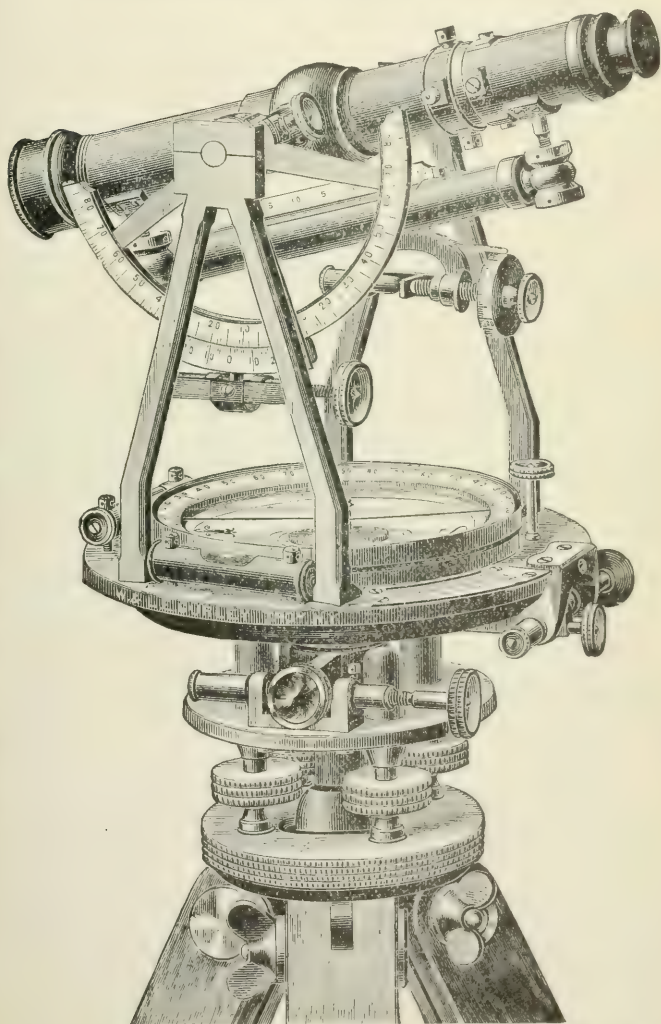
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# MONTHLY BULLETIN.

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NEW SERIES.

NOVEMBER, 1907.

No. 16.

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## REGULAR MEETING.

A regular meeting of the Boston Society of Civil Engineers will be held on Wednesday, Nov. 20, 1907, at 7.30 o'clock P. M., in

CHIPMAN HALL, TREMONT TEMPLE, BOSTON.

Mr. Stephen Child will read a paper entitled "Civic Centres and the Grouping of Public Buildings, with Suggestions for Boston."

The paper will be fully illustrated by lantern slides.

**BUSINESS OF THE MEETING:** To ballot on the applications for membership as announced in this notice.

S. E. TINKHAM, *Secretary.*

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## SANITARY SECTION MEETINGS.

The next meeting of the Sanitary Section will be held Wednesday evening, December 4th. At this meeting it is expected that Charles F. Choate, Esq., will address the Section upon the subject of expert testimony in damage cases from a legal standpoint.



At a subsequent meeting arrangements have been made for a paper by Mr. X. H. Goodnough upon the garbage disposal of the City of Boston, with especial reference to the investigations which have recently been made by a commission consisting of Messrs. William Jackson, William T. Sedgwick and X. H. Goodnough. It is also hoped during the winter to have a paper from Mr. Olin H. Landreth upon the disposal of the wastes from pulp mills; and an illustrated talk by Mr. Allen Hazen upon his recent trip to Australia.

### KEYS TO SOCIETY ROOM.

The present lock on the door of Room 715, Tremont Temple, after fifteen years' continuous use, is so badly worn that it is necessary to replace it. Arrangements have therefore been made to put a new lock into service on *Nov. 20, 1907*. Members who have keys for the present lock can exchange them for new keys on application to the Custodian of the rooms, or the Secretary will send a new key by mail on receipt of the old key.

### INFORMAL MEETINGS.

The practice, which has proved acceptable in former years of holding informal meetings on Wednesday evenings not assigned to the regular meetings of the Society and the Sanitary Section, will be continued this winter.

Members are requested to notify the Secretary of subjects which they think will be of interest to have presented. It is hoped that many of the members who have recently joined the Society will speak about matters which have come to their knowledge, even if but a short time would be needed in which to treat them as arrangements might be made to have a number of topics taken up in a single evening.

Meetings will be at 7.45 in the Society's Library, 715 Tremont Temple.

On Dec. 11, 1907, the topic for discussion will be *Methods of Finishing Concrete Surfaces*. Prof. L. J. Johnson will open the discussion, and will show some samples of finished surfaces. Prof. W. L. Mowll, Assistant Professor of Architecture at Harvard College, has accepted an invitation to be present and speak on the subject. It is also expected that Messrs. L. C. Wason, William Parker, J. R. Rablin and others of the Society will give their experiences in finishing concrete surfaces.

## SOCIETY OF ARTS MEETINGS.

Through the courtesy of the Secretary of the Society of Arts announcement is made of the following meetings of that Society:—

Dec. 5, 1907, Mr. Norman H. Cheney of the Merchants' Freezing and Cold Storage Co., Providence, R. I., on "Refrigeration"; Dec. 19, Mr. Phillip W. Ayers, State Forester from New Hampshire, will speak on the "Proposed National Forests in the White Mountains and the Southern Appalachian Mountains."

These meetings are held in Room 22, Walker Building, Massachusetts Institute of Technology, Boylston and Clarendon Streets. All interested in the subjects are invited to attend.

## CANDIDATES FOR MEMBERSHIP.

To be balloted on at meeting Nov. 20, 1907.

### AS MEMBERS.

**JULIUS W. BUGBEE**, Providence, R. I., (b. 1870). Graduated from Worcester Polytechnic Institute, Class of 1890. Chemist, Nashua Iron and Steel Co., 1890-92; chemist, Worcester Sewage Purification Works, 1892-1901; superintendent and chemist, Providence Sewage Precipitation Tanks, 1901 to date. Recommended by H. P. Eddy, J. A. McKenna, F. B. Bourne and F. O. Gage.

**JOSEPH HENRY O'BRIEN**, Yonkers, N. Y., (b. 1874). From March, 1891, to January, 1897, with W. G. Preston, architect, Boston, as student, draftsman and superintendent; January, 1897, to November, 1899, with Boston Terminal Co. as draftsman, designer and inspector; February, 1900, to March, 1902, with Rhode Island Suburban Railway Co., Providence, as assistant engineer in charge of construction; March, 1902, to November, 1902, with N. Y. C. & H. R. R. R. as assistant engineer in charge of design, Grand Central Terminal Improvements; November, 1902, to date, with Westinghouse, Church, Kerr & Co., New York City, as resident engineer, P. R. R. New York Terminal. Recommended by G. B. Francis, E. J. Beugler, A. B. Corthell and J. R. Worcester.

## APPLICATIONS FOR MEMBERSHIP.

The following applications for membership have been received and are now before the Board of Government for approval. Members having information which will assist the government in its consideration of these applications are requested to communicate at once with any member of the Board. Communications will be regarded as confidential and for the use of the Board alone.

## AS MEMBERS.

WILLIAM LEE CHURCH, Newton, Mass., (b. 1850). Graduated from Rensselaer Polytechnic Institute, Troy, in 1872. After miscellaneous practice for 10 years, member of Westinghouse, Church, Kerr & Co. till 1896; member of Lockwood, Greene & Co., Boston, till 1904; and since that time President and Consulting Engineer of the Ambursen Hydraulic Construction Co., Boston. Member, American Society of Civil Engineers, and member, American Society Mechanical Engineers. Recommended by W. S. Johnson, C. T. Main, F. W. Dean and L. C. Wason.

CHARLES CARROLL DOTEN, Plymouth, Mass., (b. 1833). Educated in public schools, graduate of high school, took special course in higher mathematics, plane and geodetic surveying and navigation. Entered office of Swan and Straw, civil engineers of Lowell, Mass., and had large practice in city engineering while with them. Located at Plymouth in general surveying business, selected routes and did all the line work for the Plymouth Water Works in the preliminary Surveys as assistant engineer; was employed by county commissioners and town authorities in road and street work. Later engaged in surveys in Minnesota and laid out Morton's addition to the town of Rochester. Captain in 38th Mass. Regiment in the Civil War, and was charged with all engineering work for the Regiment. Detailed to telegraph department and after the war was telegraph manager 15 years. Took up newspaper work, and was editor and proprietor of a leading weekly paper 30 years. Appointed on Board of Harbor and Land Commissioners and served 7 years. Has travelled extensively in United States, Canada and Mexico, and seen most of the great engineering works in these countries, comprising irrigation systems, harbor and river improvements, canalization, railroads, etc. Consulting harbor engineer of Plymouth Cordage Company. Selectman of the town of Plymouth. Recommended by F. W. Hodgdon, H. S. Adams, F. N. Wales and E. W. Hadcock.

FRANK MCCLELLAN GUNBY, Boston, (b. 1882). Graduated in the electrical course from Clemson College (S. C.) in 1902. Employed as electrical and mechanical engineer for Eagle and Phenix Mills, Columbus, Ga., from 1902 to 1905; moved to Boston in 1905 with Dean and Main, and is now with Charles T. Main, C. E. Recommended by G. E. Sleepers, C. W. Kettell, E. R. Simpson and L. D. Thorpe.

## LIST OF MEMBERS.

## ADDITIONS.

RALPH W. LOUD	.	.	.	.	.	1 Ashburton Place, Boston.
JOHN M. SHEA	.	.	.	.	.	30 Tremont St., Boston.
ROBERT A. VESPER	.	.	.	.	.	89 Waldeck St., Dorchester Centre, Mass.

## CHANGES OF ADDRESS.

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H. B. DROWNE . . . . .	9 Oriole Ave., Providence, R. I.
H. P. EDDY . . . . .	14 Beacon St., Boston.
G. G. SHEDD . . . . .	815 Banigan Bldg., Providence, R. I.
E. R. SIMPSON . . . . .	16 Cumberland St., Boston
H. A. SYMONDS . . . . .	100 White St., Waverly, Mass.
G. V. WHITE . . . . .	101 Tremont St., Boston.
E. P. WHITTEN . . . . .	104 Noyaleda, Manila, P. I.

## LIBRARY NOTES.

## BOOK REVIEWS.

*Allowable Pressures on Deep Foundations.* By Elmer Lawrence Corthell. 12 mo., 98 pages, 8 folding tables. New York, John Wiley & Sons.

[Donated by the author.]

A board of seven members, six of whom were engineers—Dr. Corthell being chairman—had occasion to discuss the allowable pressure of masonry piers on sand in the Parana River, Argentina. The plans presented by the contractors, Messrs. Hersent & Schneider of Paris, contemplated a maximum pressure of over 8 tons (of 2,000 lbs.) to the square foot. The opinion of members of the board as to the maximum allowable pressure varied from 3 tons to  $5\frac{1}{2}$  tons.

The wide difference of opinion among experts disclosed by this discussion determined Dr. Corthell to make an exhaustive investigation for the benefit of the profession. A circular letter was prepared and sent to about 300 engineers in different countries. The circular asked for information under twenty different heads, including character of underlying earth, weight per square foot thereon, frictional resistance on the sides of the piers, settlement if any, etc. Of the 300 engineers written to only one-tenth replied with any useful data.

Mr. Charles R. Wychoff, Jr., at that time assistant to Professor Burr of Columbia University, was engaged to arrange the information received in the replies from the circular in tabular form, and he was also to make a thorough study of all published data to be found in periodicals, professional papers, etc., and to arrange this in tabular form.

Eight tables thus made form one of the appendices of the book and reference is made in them to 179 different engineering



constructions. In somewhat less than half of the references the pressure of the foundation on the underlying earth is given. Thirty of these references are from replies to the circular; the others are taken from the proceedings of British and American societies of engineers, from the *Engineering News and Engineering Record*, from Patten's *Treatise on Engineering* and from other sources. The information given in the table, together with correlative and explanatory matter, is given in a more extended form in preceding appendices of the book and occupies most of its space.

The author gives a brief analysis of the tables as follows:

" *The Pressures of Stable Structures on Fine Sand* range from 2.25 tons of 2,000 lbs. to 5.80 tons, with an average of 4.5 tons with ten examples.

" *On Coarse Sand and Gravel* from 2.40 tons to 7.75 tons, with an average of 5.1 tons with thirty-three examples.

" *On Sand and Clay* from 2.5 tons to 8.5 tons, with an average of 4.9 tons, with ten examples.

" *On Alluvium and Silt* from 1.5 to 6.2 tons, with an average of 2.9 tons with seven examples.

" *On Hard Clay* from 2.0 tons to 8.0 tons, with an average of 5.08 tons with sixteen examples.

" *On Hard Pan* from 3.0 tons to 12.0 tons, with an average of 8.7 tons with five examples.

"The above cases show no settlement. The range is considerable, and, no doubt, in the case of the minimum pressure a much larger weight could have been imposed on the material without producing settlement. So that, for a safe rule, the average is low and a safe one would lie somewhere between the averages above given and the maximum pressures."

If we apply this rule to the alluvium and silt we get an allowable pressure of three tons or more to the square foot. It is not probable that much of the silt about Boston would bear any such load. In the second paragraph following the quotation above the author mentions a settlement occurring in silt and alluvium with a load of only 1.6 tons per square foot.

The book is well worth having for reference.

HOWARD A. CARSON.

#### RECENT ADDITIONS TO THE LIBRARY.

New York State Engineer Report for 1900.

Clean Water and How to Get It. Allen Hazen.

Who's Who in America, 1900.

Schenectady, N. Y., Bureau of Water, Annual Reports, 1891. 1893 ; 1895-97 ; 1900, 1905, 1906.

Springfield, Mass., Annual Report City Engineer, 1904, 1906.

St. Louis, Mo., Annual Report Water Commissioner, 1906.

St. Paul, Minn., Annual Report Water Commissioners, 1890, 1905.

Salt Lake City, Utah, Annual City Reports, 1904-06.

Cincinnati, Ohio, Annual Report Water Commissioners, 1899, 1901, 1902, 1905.

Woonsocket, R. I., Annual Report Water Commissioner, 1906.

Wilmington, Del., Annual Report Water Commissioners. 1894, 1896, 1903, 1906.

North Adams, Mass., Annual Report Public Works Department, 1906.

North Adams, Mass., Annual Town Reports, 1893-95 ; 1897-1906.

Webster, Mass., Annual Report Water Commissioners, 1903, 1906.

Albany, N. Y., Annual Report, Bureau of Water, 1906.

Rockland, Me., Annual City Reports, 1904-06.

Reading, Pa., Annual Report Water Commissioners, 1906.

Whitman, Mass., Annual Report Water Commissioners, 1904-06.

Surface Water Supply of New England, U. S. Irrigation Report.

New Jersey, State Geologist Annual Report, 1906.

Kennebec River Basin, Me. Barrows & Whipple.

Detroit, Mich., Annual Report Park Department, 1906.

Brookline, Mass., Annual Report Water Department, 1892.

Newburyport, Mass., Annual Report Water Department, 1898.

Ayer, Mass., Annual Report Water Department, 1899.

Dalton, Mass., Annual Report Water Department, 1906.

Ipswich, Mass., Annual Report Water Department, 1906.

Hinsdale, Mass., Annual Reports Water Department, 1905, 1906.

FREDERIC I. WINSLOW, *Librarian.*

## PERSONAL NEWS.

(Under this heading it is proposed to publish each month personal news relating to members of the Society. All such items of interest should be sent to the Secretary of the Excursion Committee by the first day of each month. The co-operation of members is asked to make this column a success, and they are urged to send in notes even when of a personal nature.—E. M. BLAKE, Secretary, Excursion Committee, 8 Beacon St., Boston.)

Messrs. Allen Hazen, Frederic P. Stearns and John R. Freeman have been appointed on the board of appraisal to determine the value of the plant of the Denver Union Water Co. which the City of Denver is to acquire.

\* \* \*

Mr. George S. Rice has resigned the position of chief engineer of the New York City Public Service Commission. He will, however, continue in the service of the Commission in charge of subway construction, with which he has been identified since the work began.

\* \* \*

Mr. J. P. Snow, bridge engineer of the Boston & Maine R. R., in an address before a recent meeting of the American Association of Railway Bridge Builders at Milwaukee, urged the enactment of a Federal law compelling the use of brine receptacles on refrigerator cars as a protection to bridges.

\* \* \*

The Municipal Civil Service Commission of New York will hold examinations December 17 and 19 of candidates for positions as structural steel or topographical draftsman.

The New York State Civil Service Commission will hold examinations November 30 of candidates for positions as assistant civil engineer in State Engineer's Department; and electrical engineer and gas engineer to the Public Service Commission.

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## NEW ENGINEERING WORK.

(Under this head the Excursion Committee proposes to present each month a brief résumé of engineering work in progress in New England, as far as such information is readily obtainable. The assistance of members is desired, and items of interest will be gladly received. Such items are intended to include not only works of exceptional magnitude or containing novel features, but also engineering construction work all kinds and all degrees of magnitude. Notes should be in the hands of the Committee not later than the 2nd Wednesday of each month. The thanks of the Committee are due to the members who have furnished data for the Bulletin.—E. M. BLAKE, Secretary, Excursion Committee, 8 Beacon St., Boston.)

**Commonwealth of Massachusetts.**—CHARLES RIVER BASIN COMMISSION.—At the dam,—lock gates being erected;

machinery for the Scherzer Rolling Lift Bridge being installed. Work is in progress on the Boston marginal conduit and embankment as far south as Fairfield Street.

**METROPOLITAN WATER AND SEWERAGE BOARD WATER WORKS.**—The new pumping station at Arlington near the Brattle station of the Boston & Maine R. R. is nearly completed and is expected to be in operation in a few weeks. A million and a half gallon compound condensing pump made by the Allis-Chalmers Co. is installed in this station.

Repairs to the North Dyke are completed with the exception of placing rip-rap on the slopes.

**SEWERAGE WORKS.**—Work is in progress on a variety of contracts on the extension of trunk sewer of the South Metropolitan District in Brookline, between the Roxbury and Brighton lines. Much of the work involves tunnelling in compressed air.

**METROPOLITAN PARK COMMISSION.**—The work now in progress under the direction of the Engineering Department of the Metropolitan Park Commission is as follows :—

*Lynn Fells Parkway.*—The construction of the portion from Middlesex Fells Reservation to Green Street, Melrose.

*Lynn Shore Reservation.*—The construction of extension of concrete sea wall from Red Rock to the Nahant line, and grading and surfacing of the shore drive from present ending to the Nahant line.

*Middlesex Fells Parkway.*—The construction of extension of Parkway from its junction with Forest Street to Elm Street, and the construction of roadbed for electric railway through Middlesex Fells Reservation.

*Mystic River Reservation.*—The construction of a dam, boat lock, river walls and additional span to Cradock Bridge, Main Street, Medford, and other work incidental to the maintenance of a permanent water level in the Mystic River above Cradock Bridge.

The construction of concrete bridge for the Southern Division of the Boston & Maine Railroad over the park drive along Mystic River, near West Medford.

*Quincy Shore Reservation.*—The work of surfacing and finishing shore drive from Atlantic Street to National Sailors' Home.



**HIGHWAY COMMISSION.**—State highway work is now under way in the following cities and towns:—

Barnstable, North County Road,	Palmer, Warren Road,
Boxboro, Harvard Turnpike,	Princeton, Depot Road,
Canton, Washington Street,	Pittsfield, Dalton Road,
Charlton, Southbridge Road,	Rehoboth, Providence Turnpike,
Chatham, Harwich Road,	Richmond, Pittsfield Road,
Dover, Dedham Street,	Southboro, Ashland Road,
Franklin, Central Street,	Swansea, Providence Road,
Groton—Pepperell, Nashua River	Taunton, Myricks Road,
Bridge, cement-concrete,	Warren, West Main Street.
Hancock, Lebanon Road,	West Boylston, Worcester Road,
Haverhill, Bradley Avenue,	Weymouth, Main Street,
Lee, Stockbridge,	Wilmington,
Lenox, Kemble Street,	Winchendon, Maple Street,
Medford, Mystic Avenue,	Windsor, Peru Road.

**City of Boston.**—**ENGINEERING DEPARTMENT.**—*Boylston Street Bridge.*—An interesting example of corrosion by locomotive fumes appears in the old steel and iron of Boylston Street Bridge over the Boston & Albany Railroad. The bridge was built in 1888. A plank floor has covered the floor beams and the bottom part of the trusses. Above this floor the members are still of the full original section; below the floor the metal has disappeared on the average for a depth of about an eighth of an inch on each exposed surface. Several of the eye-bar diagonals (steel) have lost 60% of their original section; some floor beam angles (iron) have lost the entire outstanding leg. The mechanical effects of the blast are much less marked than the chemical effects of the gases.

**Boston Transit Commission.**—It is expected that the following Washington-Street Tunnel work will be in progress about Nov. 15, 1907: Construction of main Tunnel in Washington Street between Court Avenue and the northerly side of State Street and in State Street at the Old State House; construction of station entrances at Summer Street and at Winter Street; construction of part of new westerly wall, roof and invert for enlargement of Subway, Haymarket Square; construction of open incline at the rear of the Relief Station; construction of hoods over tunnel entrances at Old South Meeting House and at Water Street; covering with tile finish the walls and part of ceilings of stations between LaGrange Street and Franklin Street.

**Boston Elevated Railway.**—**ELEVATED AND SUBWAY CONSTRUCTION.**—*Forest Hills Extension.*—Track work is completed to the end of the structure as erected, and the steel work

or the new Eggleston Square Station, furnished by the New England Structural Co., is in process of erection.

*South Approach to Washington Street-Tunnel.*—Steel structure connecting present structure at Castle Street with the new Washington-Street tunnel is erected. Grades of Oak and Ash Streets are being lowered to provide head room under new structure.

DEPARTMENT MOTIVE POWER AND ROLLING STOCK.—*Lincoln and Charleston Power Stations.*—The engine at Charlestown and one of the engines at Lincoln Power Station has been turned over slowly with steam.

*Central Power Station.*—Construction is under way on a brick intake tunnel 5 feet in diameter, a shaft varying in size from 15 feet at the top to 5 feet at the tunnel was sunk at the shore end and a shaft was sunk at the intake end through water, and work is underway from both shafts under about 20 pounds of air; material is hard clay. This tunnel is at elevation of about minus 30. About 20 feet of tunnel was built without air before compressor plant was installed. The work is being done by the Hugh Nawn Contracting Co.

A new chimney is being constructed by the Alphons Custodis Chimney Construction Co., and is made of their patent radial bricks.

BUREAU OF SURFACE LINES.—*Fellsway Extension.*—Work is under way on the Fellsway track from Mystic Avenue, Somerville, to near Salem Street, Medford.

Tracks on Bennington Street, Orient Heights, are to be connected with those of the Boston & Northern Ry., and cars of the Boston Elevated Ry. Co. are to run as far as Gladstone Street.

*Boylston Street Bridge.*—Repairs are under way, new trusses being erected to carry the tracks of the Boston Elevated Ry. Co.

New manganese crossings are to be laid in Mt. Auburn Street at crossing of Fitchburg R. R., the first of this kind laid in this section.

**Boston & Northern Street Ry. Co.**—Several of the bridges carrying the tracks of this company are being replaced.

The one at Andover is a steel girder bridge, about 75 feet span, over the Boston & Maine R. R. The riveting for this bridge is just being completed.

The Central Street Bridge, Lowell, is being strengthened by the addition of 8 new steel girders under the tracks of the street railway. These girders replace old belly-rod trusses.

At the Power Station in Lowell the company are building a

new steel trestle to carry coal cars into the Power Station. This trestle is about 250 feet long, and is being built mainly from material taken from a similar trestle at Bridgewater, Mass.

**Old Colony Street Ry. Co.**—Have just reopened the Raynham Trestle for traffic. The former trestle was condemned by the Railroad Commissioners, and the new work consists in strengthening the old bents and entirely replacing with new material the trusses over the New York, New Haven & Hartford R. R.

**Lowell, Mass.**—The Aberthaw Construction Company have nearly completed three concrete covered feeders or tunnels to supply water to the water wheels and pumps of the Bigelow Carpet Co. of Lowell, Mass. The three feeders are side by side, each 490 feet long, 8 feet, 6 inches wide, and average  $11\frac{1}{2}$  feet high, all inside dimensions. Altogether about 3500 cubic yards of concrete were necessary to complete this work. These feeders occupy the space between the walls of the Bigelow Carpet Company's main canal. This is the first case where a growing demand for yard room by the mills has required covering over one of the main canals. The three arched roof and walls are designed to carry spur tracks and sheds with loads of two tons per square foot and less.

**Pine Ridge, Wareham and Wrentham, Mass.**—The installation will be completed this month of a 50 H. P. Pintsh suction gas producer, Olds gas engine and Smith-Vaile 4 standard triplex pump for the Westford Water Company at Pine Ridge. Installations are also in progress of Mietz & Weiss crude oil engines and Smith-Vaile 4 standard triplex pumps for the towns of Wrentham and Wareham, Mass. All three services are from driven wells. The work is in charge of E. M. Blake, C. E.

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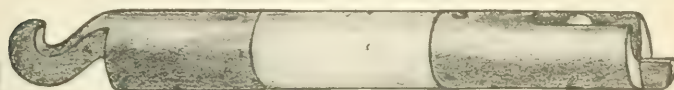
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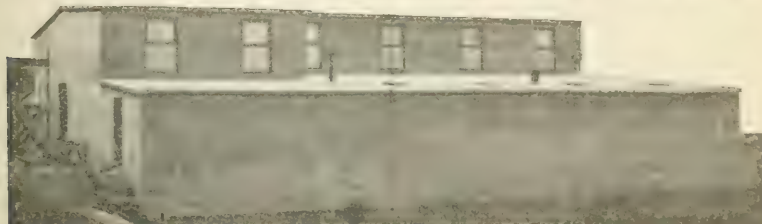
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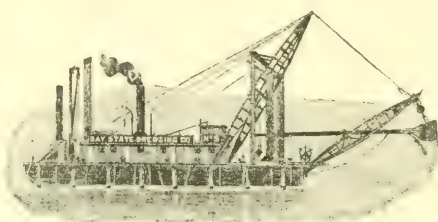
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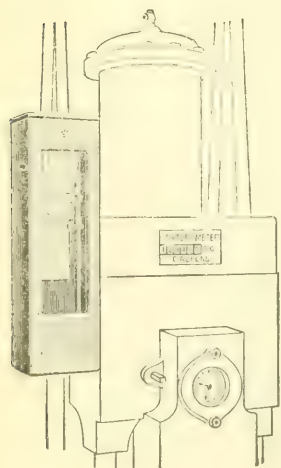
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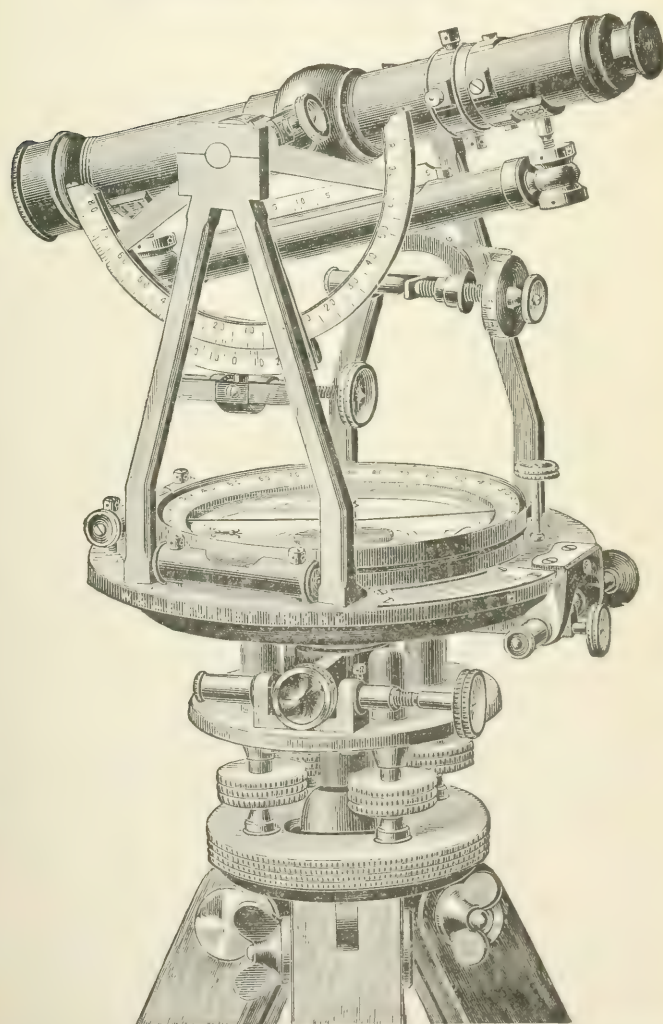
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# MONTHLY BULLETIN.

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NEW SERIES.

DECEMBER, 1907.

No. 17.

---

## REGULAR MEETING.

A regular meeting of the Boston Society of Civil Engineers will be held on Wednesday, Dec. 18, 1907, at 7.30 o'clock P. M., in

CHIPMAN HALL, TREMONT TEMPLE, BOSTON.

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The following papers will be read:—

“Economical Lubrication in Large Plants,” by Mr. W. M. Davis.

“Furnace Design in Relation to Fuel Economy,” by Mr. E. G. Bailey.

Messrs. Davis and Bailey are specialists employed by Mr. Arthur D. Little, Industrial Chemist of Boston.

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**BUSINESS OF THE MEETING:** To ballot on the applications for membership as announced in this notice.

S. E. TINKHAM, *Secretary*.

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## EXCURSION.

There will be an Excursion to South Framingham, Wednesday afternoon, December 18th, to visit new shoe shops of Richard H. Long and the boiler shops of the Robb-Mumford Co. Members



may invite guests, and will take the 1.07 train from the South Station, due in South Framingham at 1.40. Returning, take 4.30 train, due at South Station at 4.56. Members will buy their own tickets — fare, 45 cents each way.

Long's Shoe Shop is a building 480 feet long by 60 feet wide, and has five stories. The outer walls are of reinforced concrete and the floors of wooden mill construction. There are also a separate boiler house and a coal pocket of reinforced concrete. Ripley & Russell were the architects and J. R. Worcester & Co. the consulting engineers.

The Robb-Mumford shops are probably one of the most up-to-date boiler plants in the country. The main shop is 360 feet long and 153 feet wide, in three spans. The curtain walls and roof are of reinforced concrete and the frame of steel. The office building is of plaster-concrete construction. These shops were designed by E. E. Pettee.

#### EXCURSION COMMITTEE.

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#### KEYS TO SOCIETY ROOM.

Attention of members is again called to the change that has been made in the lock to Room 715, Tremont Temple. Those who have keys to the old lock can exchange them for keys to the new on application to the Custodian of the rooms, or the Secretary will send a new key by mail on receipt of the old key.

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#### INFORMAL MEETINGS.

The practice, which has proved acceptable in former years, of holding informal meetings on Wednesday evenings not assigned to the regular meetings of the Society and the Sanitary Section, will be continued this winter.

Members are requested to notify the Secretary of subjects which they think will be of interest to have presented.

Meetings will be at 7.45 in the Society's Library, 715 Tremont Temple.

On Jan. 8, 1908, Mr. Henry B. Wood will give an informal talk on "Difficulties Encountered in the Town Boundary Survey and the Application of Plane Table Work to Portions of the Survey."

## CANDIDATES FOR MEMBERSHIP.

To be balloted on at meeting, Dec. 18, 1907.

### AS MEMBERS.

**WILLIAM LEE CHURCH**, Newton, Mass., (b. 1850). Graduated from Rensselaer Polytechnic Institute, Troy, in 1872. After miscellaneous practice for 10 years, member of Westinghouse, Church, Kerr & Co. till 1896; member of Lockwood, Greene & Co., Boston, till 1904; and since that time President and Consulting Engineer of the Ambursen Hydraulic Construction Co., Boston. Member, American Society of Civil Engineers, and member, American Society Mechanical Engineers. Recommended by W. S. Johnson, C. T. Main, F. W. Dean and L. C. Wason.

**CHARLES CARROLL DOTEN**, Plymouth, Mass., (b. 1833). Educated in public schools, graduate of high school, took special course in higher mathematics, plane and geodetic surveying and navigation. Entered office of Swan and Straw, civil engineers of Lowell, Mass., and had large practice in city engineering while with them. Located at Plymouth in general surveying business, selected routes and did all the line work for the Plymouth Water Works in the preliminary Surveys as assistant engineer; was employed by county commissioners and town authorities in road and street work. Later engaged in surveys in Minnesota and laid out Morton's addition to the town of Rochester. Captain in 38th Mass. Regiment in the Civil War, and was charged with all engineering work for the Regiment. Detailed to telegraph department and after the war was telegraph manager 15 years. Took up newspaper work, and was editor and proprietor of a leading weekly paper 30 years. Appointed on Board of Harbor and Land Commissioners and served 7 years. Has travelled extensively in United States, Canada and Mexico, and seen most of the great engineering works in these countries, comprising irrigation systems, harbor and river improvements, canalization, railroads, etc. Consulting harbor engineer of Plymouth Cordage Company. Selectman of the town of Plymouth. Recommended by F. W. Hodgdon, H. S. Adams, F. N. Wales and E. W. Hadcock.

**FRANK McCLELLAN GUNBY**, Boston, (b. 1882). Graduated in the electrical course from Clemson College (S. C.) in 1902. Employed as electrical and mechanical engineer for Eagle and Phenix Mills, Columbus, Ga., from 1902 to 1905; moved to Boston in 1905 with Dean and Main, and is now with Charles T. Main, C. E. Recommended by G. E. Sleepers, C. W. Kettell, E. R. Simpson and L. D. Thorpe.

## SOCIETY OF ARTS MEETINGS.

Through the courtesy of the Secretary of the Society of Arts announcement is made of the following meetings of that Society:—

Dec. 19, 1907, Mr. Philip W. Ayers, State Forester of New Hampshire, will speak on "Forestry" with special reference to

the proposed national reserves in the White and Appalachian Mountains.

Jan. 9, 1908, Mr. Rufus F. Herrick will speak on "Denatured Alcohol and Its Industrial Applications." The lecture will be illustrated with lantern slides and demonstrations.

Jan. 23, 1908, Prof. John E. Wolff of Harvard University will speak on "Ascents of Colima and Orizaba, Two Mexican Volcanoes." The lecture will be illustrated with lantern slides.

These meetings are held in Room 22, Walker Building, Massachusetts Institute of Technology, Boylston and Clarendon Streets. All interested in the subjects are invited to attend.

### APPLICATIONS FOR MEMBERSHIP.

The following applications for membership have been received and are now before the Board of Government for approval. Members having information which will assist the government in its consideration of these applications are requested to communicate at once with any member of the Board. Communications will be regarded as confidential and for the use of the Board alone.

#### AS MEMBERS.

WILLIAM HOYT BALCH, Stoneham, Mass., (b. 1874). B. S., Dartmouth College, 1897, and C. E., Thayer School of Civil Engineering, 1898. In City Engineer's office, Nashua, N. H., 1892, 1893; and a few months on B. & A. R. R.; July to Dec., 1898, U. S. Inspector, Portland, Me.; April to Nov., 1899, shop inspector, Berlin Iron Bridge Co.; Dec., 1899, to April, 1901, Junior Engineer, U. S. Engineer's office, Portsmouth, N. H.; June to Oct., 1901, Engineer, Aberthaw Construction Co.; Oct., 1901, to July, 1902, Engineer, Berlin Construction Co., in charge of foundation and subcontract work; July, 1902, to Nov., 1903, Engineer, Southern Expanded Metal Co., Washington, D. C.; and Nov., 1903, to date, Engineer for Aberthaw Construction Co., Boston. Recommended by L. C. Wason, W. M. Bailey, C. J. Hogue and Leonard Metcalf.

THOMAS FRANCIS CAMPBELL, Providence, R. I., (b. 1878). Educated in the public schools of Providence, and graduated from the Manual Training High School in 1897. Entered the City Engineer's office, Providence, July, 1897; from 1897 to 1900, with Park Department on construction of drives, paths, general grading and surveying; 1900 to 1905 with Highway Department on profiles, estimates, grades and construction of highways; 1905 to 1906 on construction of bridge abutments and piers; and at present Assistant Engineer in the Street Line and Street Layout Dept. Recommended by F. B. Bourne, H. J. Reynolds, J. A. McKenna and C. F. Janes.

ALBION MARSHALL DEANE, South Weymouth, Mass., (b. 1881). Three years at Mass. Institute of Technology, 1904, and one semester at Harvard under Prof. L. J. Johnson. Has been employed in the engineering departments of the following companies: The Steel Cable Engineering Co. in 1903; Pennsylvania Steel Co., 1903 to 1904; City of Harrisburg, three months on special job; Central States Bridge Co. and Noelke Richards Iron Works, Indiana, 1904 to Oct., 1905; Penn Bridge Co., Oct., 1905, to Sept., 1906; and with the Boston Bridge Works since Feb., 1907. Recommended by J. C. Moses, F. H. Fay, S. H. Thorndike and D. H. Andrews.

WALTER JOSEPH GRADY, Providence, R. I., (b. 1879). Graduated from Providence Technical High School in 1897. Entered the office of a local civil engineer as a student in 1898, completed studentship in 1901. Has since been engaged as civil engineer and surveyor in general municipal practice in Rhode Island and Massachusetts, including sewer, bridge, building, street and highway construction, also some electric railway location work; now civil engineer and surveyor with J. A. Latham of Providence, Town Engineer of Cranston, R. I. Recommended by I. S. Wood, E. W. Ross, H. J. Reynolds and C. F. Janes.

ANGUS BURLINGAME MACMILLAN, Brookline, (b. 1882). Brookline High School, 1899. From Aug., 1899, to Feb., 1900, student in office of O. A. Thayer, Architect; Feb. to Oct., 1900, draftsman with Stephen Codman, Architect; Oct., 1900, to Dec., 1902, draftsman with Kendall, Taylor & Stevens, Architects; Jan., 1902, to Jan., 1904, draftsman with Lockwood, Green & Co., Mill Engineers and Architects; March, 1904, to date, with Aberthaw Construction Co. as follows: March, 1904, to Jan., 1907, draftsman; Jan., 1907, to date, chief draftsman, engaged in designing and preparing plans for important reinforced concrete construction. Recommended by L. C. Wason, W. M. Bailey, C. J. Hogue and Leonard Metcalf.

ARTHUR DANIEL WESTON, Boston, (b. 1884). Graduated from High School in 1902, and 1905 and 1906 at Dartmouth College: 1902 and 1903 rodman and inspector, B. F. Sturtevant Co.; 1903 and 1904 rodman and transitman with Mass. Highway Commission, also during the summers of 1905 and 1906; and since 1906 with State Board of Health. Recommended by X. H. Goodnough, W. S. Johnson, R. M. Whittle and Charles Saville.

## MINUTES OF MEETINGS.

### OCTOBER MEETING OF THE SOCIETY.

Boston, Oct. 16, 1907 —A regular meeting of the Boston Society of Civil Engineers was held at Chipman Hall, Tremont



Temple, at 8 o'clock p. m., President Edward W. Howe in the chair. Seventy-two members and visitors present.

The record of the last meeting was read and approved.

Messrs. Ralph W. Loud, Robert A. Vespers and Frederic J. Wood were elected members of the Society.

The President then introduced Mr. Edward W. DeKnight of New York, Manager of the Hydrex Felt and Engineering Co., who read a paper entitled "Waterproof Engineering." The paper was illustrated by lantern slides. A general discussion followed on the waterproofing of concrete and on the necessity of protecting steel embedded in concrete, in which Mr. C. T. Purdy of New York and a number of the members of the Society took part.

On motion of Mr. Larned, the thanks of the Society were voted to Mr. DeKnight for the very interesting paper which he had read.

Adjourned.

S. E. TINKHAM, *Secretary.*

## NOVEMBER MEETING OF THE SANITARY SECTION.

A meeting of the Sanitary Section was held at the Boston City Club Friday evening, Nov. 15, 1907, with sixty-one members present. Prof. C. E. A. Winslow and Prof. E. B. Phelps read a paper entitled, "Purification of Boston Sewage — Experimental Results and Practical Possibilities." The paper was discussed by Prof. W. T. Sedgwick, Mr. X. Y. Goodnough and others. The attendance at the dinner which preceded the meeting was forty-four.

WILLIAM S. JOHNSON, *Clerk.*

## DECEMBER MEETING OF THE SANITARY SECTION.

A meeting of the Sanitary Section was held at the Boston City Club Wednesday evening, Dec. 4, 1907. Mr. Charles F. Choate, Jr., addressed the Section upon the "Pollution of Waters at Common Law and Under Statutes." The attendance was forty-five.

WILLIAM S. JOHNSON, *Clerk.*

## LIBRARY NOTES.

### RECENT ADDITIONS TO THE LIBRARY.

Recollections of an Ill-Fated Expedition, Craig. Gift of F. A. Snow.

Free Hand Lettering, F. T. Daniels.

American Water Works Association, 1907.

Philadelphia, Pa., Annual Report Public Works, 1906.

Michigan State Board of Health, Annual Report, 1906.

Massachusetts State Board of Health, Annual Report, 1906.

Tables for Estimates, Hauch and Rice.

Northampton, Mass., Annual City Report, 1906.

Boston, Mass., Annual Report Park Department, 1906.

Reading, Mass., Annual Report Water Commissioners, 1905, 1906.

Providence, R. I., Quarterly Report Department of Public Works.

New Jersey Public Health Laws.

Chicago, Ill., Disposal of Sewage in Calumet Division.

Westborough, Mass., Annual Town Report, 1901.

First Twenty Years of Venturi Meter.

United States Government Report on Disinfection of Sewage Effluents.

Rockland, Mass., Annual Report Water Commissioners, 1898-1906.

FREDERIC I. WINSLOW, *Librarian.*

## NEW ENGINEERING WORK.

(Under this head the Excursion Committee proposes to present each month a brief résumé of engineering work in progress in New England, as far as such information is readily obtainable. The assistance of members is desired, and items of interest will be gladly received. Such items are intended to include not only works of exceptional magnitude or containing novel features, but also engineering construction work of all kinds and all degrees of magnitude. Notes should be in the hands of the Committee not later than the 2nd Wednesday of each month. The thanks of the Committee are due to the members who have furnished data for the Bulletin.—E. M. BLAKE, Secretary, Excursion Committee, 8 Beacon St., Boston.)

**Commonwealth of Massachusetts.**—CHARLES RIVER BASIN COMMISSION.—At the dam, lock gates being erected and some concrete being placed in the sluices. The masonry on the Boston and Cambridge side of the dam is substantially completed.

Work on the Cambridge Marginal Conduit is in progress, which is being depressed under the Lechmere Canal in an inverted siphon of two 48-inch pipes.

The work on the Boston Marginal Conduit is in progress as far south as Massachusetts Avenue.

**Boston Transit Commission.**—It is expected that the following Washington-Street Tunnel work will be in progress about Dec. 15, 1907: Construction of station at Old State House; construction of station entrances at Summer Street and at Winter Street; construction of part of new westerly wall, roof and invert for enlargement of Subway, Haymarket Square; construction of open incline at the rear of the Relief Station; covering with tile finish the walls and part of ceilings of stations between LaGrange Street and Franklin Street.

**Boston Elevated Railway.**—ELEVATED AND SUBWAY CONSTRUCTION.—*Forest Hills Extension.*—The steel structure for the new Egleston Square Station, furnished by the New England Structural Co., is practically erected.

*South Approach, Washington-Street Tunnel.*—Steel structure connecting present structure at Castle Street to the new Washington-Street Tunnel is erected and being painted. Oak and Ash Streets have been lowered and all alterations to property made necessary by these grade changes have been completed.

*East Cambridge Extension.*—Construction on this extension has been going on for a short time, and portions of the foundations for the piers supporting the proposed new elevated railway bridge across the lower or down stream slope of the Charles River dam have been constructed on both sides of the large ship lock, and work is under way on others on the East Cambridge side of the river adjoining the small boat lock and sluices. This work is being done by the Holbrook, Cabot & Rollins Corporation.

**BUREAU OF SURFACE LINES.**—The Park-Street loop is being reconstructed to accommodate the new semi-convertible cars now being operated by the Boston Elevated Railway Co.

**DEPARTMENT MOTIVE POWER AND ROLLING STOCK.**—*Central Power Station.*—Work on the intake tunnel is practically completed and the changes to this station are well along toward completion.

**Boston and Maine Railroad.**—BELMONT, MASS.—Work on separation of grades is progressing rapidly. Track raising for four tracks, 5 feet above the original grade, from Hill Crossing to

a point about 1500 feet west of Belmont Station, a distance of about one mile, is complete. One-half the arch and foot subway were completed November 1st, and all traffic turned over same to permit excavation and construction of northerly half of arch. Trains were carried on temporary tracks around the work during construction of southerly half of arch and subway.

Street traffic is carried over tracks on a temporary raised driveway.

Highway work south of railroad, including sewers, water pipes, drainage, etc., is complete. Highway work north of railroad about one-fourth completed.

NORTH CHELMSFORD, MASS.—*Princeton Street Separation of Grades*.—Masonry work is all completed, and street filling three-quarters completed.

AYER, MASS.—*Foot Subway under Tracks*.—Work started November 26th, and the excavation is nearly completed.

BOSTON.—*North Station*.—An extension of east wing for use of American Express Co. is in progress. Building, 270 feet by 70 feet, two stories, with covered awning at north, and 150 feet long by 50 feet wide. The work involves building about 50,000 square feet of pile wharf, considerable track work and moving several buildings.

METHUEN, MASS.—*Passenger Station*.—Brick and stone building, 26 feet by 58 feet, with covered awning 250 feet long, tile floors, enamel brick interior finish and slate roof.

SOUTH LAWRENCE, MASS. — *Freight House*.—Office building, 30 feet by 60 feet, three stories; freight house, 60 feet by 600 feet; transfer platforms, 600 feet by 8 feet. Buildings of brick with stone trimmings.



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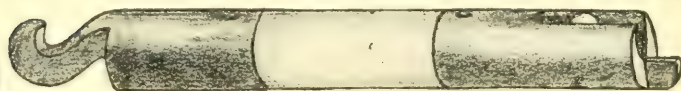
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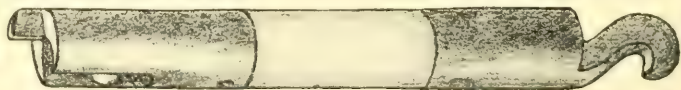
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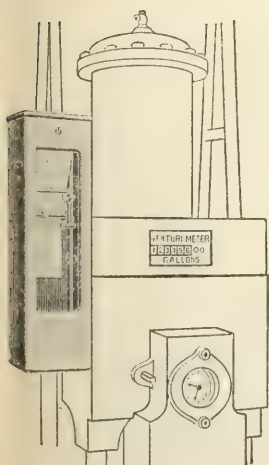
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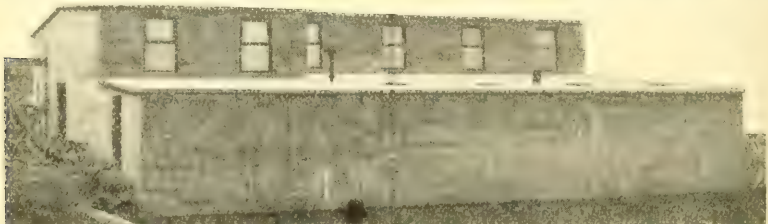
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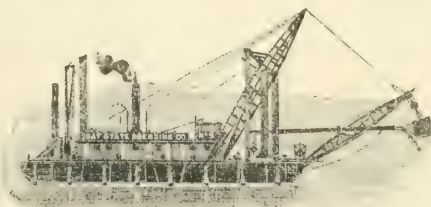
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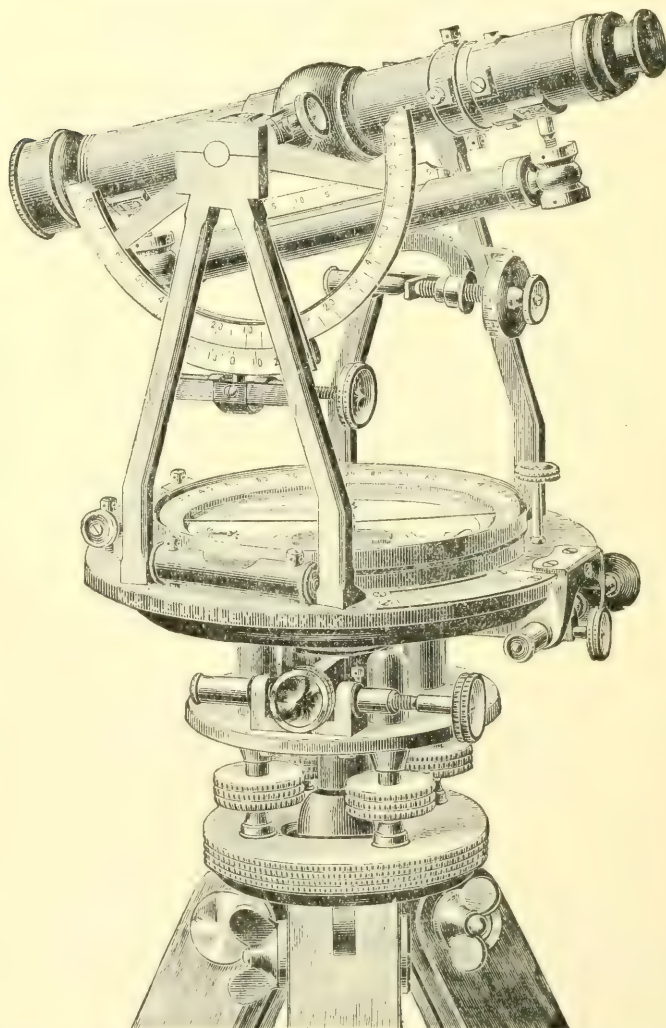
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**BOSTON SOCIETY OF CIVIL ENGINEERS.**

**ORGANIZED JULY 3, 1848.**

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# MONTHLY BULLETIN.

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NEW SERIES.

JANUARY, 1908.

No. 18.

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## REGULAR MEETING.

A regular meeting of the Boston Society of Civil Engineers will be held on Wednesday, Jan. 22, 1908, at 7.30 o'clock P. M., in

CHIPMAN HALL, TREMONT TEMPLE, BOSTON.

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A talk will be given on the Double-Track Railroad Tunnel under the Detroit River, at Detroit, by H. A. Carson of Boston, W. J. Wilgus of New York and probably one of the contractors from Detroit. The lantern will be used to illustrate the talk.

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**BUSINESS OF THE MEETING:** To ballot on the applications for membership as announced in this notice.

To choose a committee of five to nominate officers for the ensuing year.

S. E. TINKHAM, *Secretary.*

## SANITARY SECTION MEETING.

The next meeting of the Sanitary Section will be held at the Boston City Club, Wednesday evening, Feb. 5, 1908. Prof. Olin H. Landreth of Schenectady, N. Y., will present a paper upon "Pulp Wastes."



## KEYS TO SOCIETY ROOM.

Attention of members is once more called to the change that has been made in the lock to Room 715, Tremont Temple. Those who have keys to the old lock can exchange them for keys to the new on application to the Custodian of the Rooms, or the Secretary will send a new key by mail on receipt of the old key.

## INFORMAL MEETINGS.

The practice, which has proved acceptable in former years, of holding informal meetings on Wednesday evenings not assigned to the regular meetings of the Society and the Sanitary Section, will be continued this winter.

Members are requested to notify the Secretary of subjects which they think will be of interest to have presented.

Meetings will be at 7.45 in the Society's Library, 715 Tremont Temple.

On Jan. 29, 1908, Mr. Lewis M. Hastings will give a "Description of a Concrete Steel Parkway Bridge over the Branch of the B. & A. R. R. in the line of the Charles River Road, Cambridge."

On Feb. 12, 1908, a meeting will be held at which the following papers read at the December meeting will be discussed:—

"Economical Lubrication in Large Plants," by Mr. W. M. Davis.

"Furnace Design in Relation to Fuel Economy," by Mr. E. G. Bailey.

Proof copies of these papers will be ready for distribution about February 1st, and will be sent to members on application to the Secretary.

## SOCIETY OF ARTS MEETINGS.

Through the courtesy of the Secretary of the Society of Arts announcement is made of the following meetings of that Society:—

Jan. 23, 1908, Prof. John E. Wolff of Harvard University will speak on "Ascents of Colima and Orizaba, Two Mexican Volcanoes." The lecture will be illustrated with lantern slides.

These meetings are held in Room 22, Walker Building, Massachusetts Institute of Technology, Boylston and Clarendon Streets. All interested in the subjects are invited to attend.

## CANDIDATES FOR MEMBERSHIP.

To be balloted on at meeting, Jan. 22, 1908.

### AS MEMBERS.

**WILLIAM HOYT BALCH**, Stoneham, Mass., (b. 1874). B. S., Dartmouth College, 1897, and C. E., Thayer School of Civil Engineering, 1898. In City Engineer's office, Nashua, N. H., 1892, 1893; and a few months on B. & A. R. R.; July to Dec., 1898, U. S. Inspector, Portland, Me.; April to Nov., 1899, shop inspector, Berlin Iron Bridge Co.; Dec., 1899, to April, 1901, Junior Engineer, U. S. Engineer's office, Portsmouth, N. H.; June to Oct., 1901, Engineer, Aberthaw Construction Co.; Oct., 1901, to July, 1902, Engineer, Berlin Construction Co. in charge of foundation and subcontract work; July, 1902, to Nov., 1903, Engineer, Southern Expanded Metal Co., Washington, D. C.; and Nov., 1903, to date, Engineer for Aberthaw Construction Co., Boston. Recommended by L. C. Wason, W. M. Bailey, C. J. Hogue and Leonard Metcalf.

**THOMAS FRANCIS CAMPBELL**, Providence, R. I., (b. 1878). Educated in the public schools of Providence, and graduated from the Manual Training High School in 1897. Entered the City Engineer's office, Providence, July, 1897; from 1897 to 1900, with Park Department on construction of drives, paths, general grading and surveying; 1900 to 1905 with Highway Department on profiles, estimates, grades and construction of highways; 1905 to 1906 on construction of bridge abutments and pierst and at present Assistant Engineer in the Street Line and Street Layout Dept. Recommended by F. B. Bourne, H. J. Reynolds, J. A. McKenna and C. F. Janes.

**ALBION MARSHALL DEANE**, South Weymouth, Mass., (b. 1881). Three years at Mass. Institute of Technology, 1904, and one semester at Harvard under Prof. L. J. Johnson. Has been employed in the engineering departments of the following companies: The Steel Cable Engineering Co. in 1903; Pennsylvania Steel Co., 1903 to 1904; City of Harrisburg, three months on special job; Central States Bridge Co and Noelke Richards Iron Works, Indiana, 1904 to Oct., 1905; Penn Bridge Co., Oct., 1905, to Sept., 1906; and with the Boston Bridge Works since Feb., 1907. Recommended by J. C. Moses, F. H. Fay, S. H. Thorndike and D. H. Andrews.

**WALTER JOSEPH GRADY**, Providence, R. I., (b. 1879). Graduated from Providence Technical High School in 1897. Entered the office of a local civil engineer as a student in 1898, completed studentship in 1901. Has since been engaged as civil engineer and surveyor in general municipal practice in Rhode Island and Massachusetts, including sewer, bridge, building, street and highway construction, also some electric railway location work; now civil engineer and surveyor with J. A. Latham of Providence, Town Engineer of Cranston, R. I. Recommended by I. S. Wood, E. W. Ross, H. J. Reynolds and C. F. Janes.

ANGUS BURLINGAME MACMILLAN, Brookline, (b. 1882). Brookline High School, 1899. From Aug., 1899, to Feb., 1900, student in office of O. A. Thayer, Architect; Feb. to Oct., 1900, draftsman with Stephen Codman, Architect; Oct., 1900, to Dec., 1902, draftsman with Kendall, Taylor & Stevens, Architects; Jan., 1902, to Jan., 1904, draftsman with Lockwood, Green & Co., Mill Engineers and Architects; March, 1904, to date, with Aberthaw Construction Co as follows: March, 1904, to Jan., 1907, draftsman; Jan., 1907, to date, chief draftsman, engaged in designing and preparing plans for important reinforced concrete construction. Recommended by L. C. Wason, W. M. Bailey, C. J. Hogue and Leonard Metcalf.

ARTHUR DANIEL WESTON, Boston, (b. 1884). Graduated from High School in 1902, and 1905 and 1906 at Dartmouth College; 1902 and 1903 rodman and inspector, B. F. Sturtevant Co.; 1903 and 1904 rodman and transitman with Mass. Highway Commission, also during the summers of 1905 and 1906; and since 1906 with State Board of Health. Recommended by X. H. Goodnough, W. S. Johnson, R. M. White and Charles Saville.

## APPLICATIONS FOR MEMBERSHIP.

The following applications for membership have been received and are now before the Board of Government for approval. Members having information which will assist the government in its consideration of these applications are requested to communicate at once with any member of the Board. Communications will be regarded as confidential and for the use of the Board alone.

### AS MEMBERS.

THOMAS GEORGE HAZARD, JR., Narragansett Pier, R. I., (b. 1862). Educated at Brown University. Has conducted a general civil engineering business at Narragansett Pier since about 1887; has been town surveyor and engineer for Town of Narragansett since 1890. Is at present engaged in civil engineering, and since February, 1902, superintendent, Narragansett Pier Railroad. Recommended by Williard Kent, C. W. Sherman, J. C. Whitney and E. W. Howe.

WALTER TOBIAS WILEY, Boston, (b. 1885). Graduated from Dorchester High School in 1903 and from its post graduate course in 1904. In June, 1905, entered the employ of D. W. Hyde, surveyor, in May, 1906, entered the employ of the Boston Elevated Ry. Co., during summer of 1907, had charge of party in base line survey, and is now with some company in the Department of Elevated and Subway Construction, rating as transitman. Recommended by E. R. Kimball, A. F. Brown, G. A. Kimball and E. R. Olin.

DANA MELVIN WOOD, Belmont, Mass., (b. 1884). Student at Mass. Institute of Technology, September, 1902, to February, 1907, taking regular course in civil engineering and special subjects in sanitary engineering. From July to September, 1901, rodman, Brockton Canal Survey; June to September, 1903, rodman on Mass. Town Boundary Surveys; summer of 1904, rodman for Town of Brookline; July to September, 1905, rodman, U. S. Geological Survey, on surveys of several rivers and lakes in Maine; June and July, 1906, assistant engineer, N. Y. Board of Water Supply, leaving on account of severe illness; August to October, 1906, assistant engineer for Robert Spurr Weston on new water supply for hospital, Gravenhurst, Canada; January to August, 1907, hydrographic aid, U. S. Geological Survey; and at latter date promoted to junior hydrographer, which position he now holds. Recommended by H. K. Barrows, C. B. Breed, A. H. French and F. W. Hodgdon.

## MINUTES OF MEETINGS.

### MEETINGS OF THE SOCIETY.

Boston, Nov. 20, 1907. — A regular meeting of the Boston Society of Civil Engineers was held at Chipman Hall, Tremont Temple, at 8.10 o'clock P.M.: President E. W. Howe in the chair; thirty-five members and visitors present.

The record of the last meeting was read and approved.

Messrs. Julius W. Bugbee and Joseph H. O'Brien were elected members of the Society.

On motion of the Secretary, the thanks of the Society were voted to Admiral Francis T. Bowles, president of the Fore River Ship Building Company, and to his assistant, Mr. J. J. Crain, for courtesies extended to the Society on the occasion of the excursion to the works of that company at Quincy Point on Nov. 15, 1907.

In the absence of the author, Mr. Stephen Child, the Secretary then read the paper of the evening, entitled, "Civic Centers and the Grouping of Public Buildings, with Suggestions for Boston." The paper was fully illustrated by lantern slides.

Mr. C. Howard Walker, in response to an invitation of the President, spoke of the many admirable opportunities in Boston for the grouping of public buildings, and of the efforts which had been made by the architects to awaken public interest in the matter.



Mr. Sylvester Baxter, secretary of the Metropolitan Improvements Commission, was also introduced and spoke entertainingly of the development of the plan of the late Charles Eliot for the improvement of the Metropolitan district. He also gave an account of the work of the Metropolitan Improvements Commission.

After passing a vote of thanks to Messrs. Walker and Baxter for their discussion of the subject-matter of the evening, the Society adjourned.

BOSTON, DEC. 18, 1907.—A regular meeting of the Boston Society of Civil Engineers was held at Chipman Hall, Tremont Temple, at 8 o'clock P.M., Vice-President Francis W. Dean in the chair; thirty-six members and visitors present.

The record of the last meeting was read and approved.

Messrs. William L. Church, Charles C. Doten and Frank M. Gunby was elected members of the Society.

On motion of Mr. F. L. Fuller, the thanks of the Society were voted to Mr. F. H. Keys, general manager of the Robb-Mumford Company, and to Messrs H. L. Egan and Richard H. Long, for courtesies extended to members of the Society on the occasion of the visit to the boiler shops of the Robb-Mumford Company, and to the new shoe shops of Richard H. Long, at South Framingham, this afternoon.

The Chairman then introduced Mr. W. M. Davis of Boston, who read a paper entitled, "Economical Lubrication in Large Plants."

The paper was discussed by the Chairman and Messrs. Francis H. Boyer, Ira N. Hollis and Irving E. Moulthrop.

The second paper of the evening was presented by Mr. E. G. Bailey of Boston, entitled "Furnace Design in Relation to Fuel Economy."

Owing to the lateness of the hour it was voted to continue the discussion of both papers at a meeting to be called after they had been placed in type and distributed to members interested in the subjects.

After passing a vote of thanks to Messrs. Davis and Bailey for their interesting papers which they had presented, the Society adjourned.

S. E. TINKHAM, *Secretary*.

## SANITARY SECTION MEETING.

A regular meeting of the Sanitary Section was held at the Boston City Club, Wednesday evening, Jan. 1, 1908, with forty-three members present. A paper by N. H. Goodnough upon the collection and disposal of municipal wastes and refuse was read by the clerk. The paper was fully illustrated with lantern slides and was discussed by Mr. H. Norman Leask, of Liverpool, England.

WILLIAM S. JOHNSON, *Clerk.*

## SANITARY SECTION.

### PRELIMINARY REPORT OF THE COMMITTEE ON RUN-OFF FROM SEWERED AREAS.

BOSTON, MASS., Jan. 1, 1908.

The committee appointed by the Sanitary Section of the Boston Society of Civil Engineers to collect such data as may be in existence, and to procure additional data concerning the relation between the rainfall upon and the run-off from sewered areas has succeeded in establishing a few stations for observations of rainfall and runoff, has studied the information thus obtained and formulated a few suggestions as to methods of procedure which may be of service to those interested in similar work, and is taking this opportunity to send out the following to parties who may be willing to co-operate with the committee.

For the purposes of this investigation, the committee is of the opinion that the apparatus mentioned below, if properly installed and cared for, will give satisfactory results.

#### INSTALLATION OF APPARATUS.

First:—Automatic Recording Rain Gage. This should be located as near the centre of the drainage area as practicable, at a point free from obstructions such as buildings, trees, etc., preferably on level ground. On large areas the value of the results will be increased if more than one rain gage is installed.

Second:—Standard Rain Gages. These should be so placed as to show the variation of the precipitation over the watershed under consideration. One gage should occasionally be used for the purpose of checking the automatic rain gage.

Third:—Automatic Run-off Gage. This should be installed preferably in a side chamber connected by a pipe, with the drain to be observed, but where this is not practicable it may be installed in the drain itself, the float being protected by a surrounding chamber so arranged as to counteract the impact of the water. The clockwork and recording device may be installed in a manhole, but will give much better results if placed in a box above ground, so constructed as to exclude most of the moisture coming from the drain. Such boxes, like police boxes, have in some cases been placed on posts located either on the curb line of the street or on private property.

Fourth:—Maximum Run-off Gages. At least three of these gages should be provided, one placed as near the automatic run-off gage as practicable, another below and the third above the automatic gage on the same line of drain, these gages to be used to check the automatic gage and to determine the slope of the water surface.

#### COST OF APPARATUS.

If ten stations are established calling for new apparatus, the following club prices may be obtained:—

1 recording rain gage . . . . .	\$100.00
2 standard rain gages at \$10 . . . . .	20.00
1 run-off gage . . . . .	45.00
3 maximum run-off gages . . . . .	3.00
	<hr/> \$168.00

#### RECORDS.

There has also been considered the matter of a standard form of chart to be furnished by the committee, upon which the results obtained at the various stations are to be recorded, and sent in. A tentative form for the same has been prepared, and copies may be obtained upon application to the Secretary of Committee.

The committee deems it necessary that each observer should furnish in addition to the charts, the data suggested in the following schedule:

1. Drainage area. Map of drainage area, preferably to a scale of 100 feet to one inch or multiples thereof, with elevation at street intersections noted, and tributary area computed.

Show all drains with sizes, invert elevations at man-holes and rates of slope, catch basins and overflows.  
All ponds, brooks and other natural or artificial channels.

Different areas making up watershed colored as follows:—

Swamp, dark green. Areas computed.

Wooded, light green with trees. Areas computed.

Meadow, light green with edges of high land brought out. Areas computed.

Streets, whether gravel, macadamized or paved and form of paving used. Areas computed.

State number of houses and other buildings with connections, and indicate manufacturing establishments, if any.

2. Rain gage. Sketch showing location of rain gage with surrounding objects, approximate elevation above ground and distance from nearest trees, buildings, etc. Scale 10 feet = 1 inch.

Type of automatic recording gages used.

Sample dial or sheet.

3. Measuring station. Plan and elevation of run-off measuring station, connection with recording gage, etc. 10 feet = 1 inch or larger.

Type of automatic recording float gage used.

Sample dial or sheet.

The committee will be pleased to receive any suggestions or advice, and it is particularly desirous of co-operation on the part of those interested by the establishing of as many gaging stations as possible.

The committee will be glad to furnish, so far as lies within its power, any further information or suggestions concerning the scope of the work or the apparatus required.

It is intended that proper credit shall be given to those furnishing data, for their respective contributions. The committee expects to keep in close touch with those making observations, and give to each the benefit of the experience of other observers, and also the results obtained as soon as practicable.

While the Sanitary Section, through its Committee, has taken the initiative in starting this investigation the function of the committee will be merely that of a Clearing House. The value of the results must depend upon the number and interest of those who co-operate.



Address correspondence to the Secretary of the Committee,  
Harrison P. Eddy, 14 Beacon St., Boston.

IRVING T. FARNHAM, Chairman,	} <i>Committee.</i>
GEORGE A. CARPENTER,	
HECTOR J. HUGHES,	
HARRISON P. EDDY,	
L. M. HASTINGS,	
ARTHUR T. SAFFORD,	
W. S. JOHNSON,	

### LIST OF MEMBERS.

#### ADDITIONS.

JULIUS W. BUGBEE	290 Mass. Avenue, Providence, R. I.
CHARLES C. DOTEN	Plymouth, Mass.
FRANK M. GUNBY	45 Milk St., Boston.
JOSEPH H. O'BRIEN	10 Bridge St., New York, N. Y.
FREDERIC J. WOOD	Foxboro, Mass.

#### CHANGES OF ADDRESS.

C. W. AIKEN	800 East 12th St., Brooklyn, N. Y.
T. T. ALLARD	San Antonio de los Banos, Cuba.
GUY C. EMERSON	4 Brewer St., Jamaica Plain.
G. N. FERNALD	Intervale, Me.
G. E. HARKNESS	10 Donkin Terrace, Dorchester.
A. W. HUNKING	374 Stevens St., Lowell, Mass.
J. J. PHELAN	8 Old Court House, Baltimore, Md.
C. M. SAVILLE	Ancon, Canal Zone, Panama.
G. E. SLEEPER	Box 3198, Boston.
H. C. STEVENS	Mineola, Long Island, N. Y.
G. A. WETHERBEE	Box 64, Los Angeles, Cal.
C. E. WELLS	Realty Bldg., White Plains, N. Y.
G. W. WOOD	263 East 4th St., Salt Lake City, Utah.
M. G. WOODWARD	14 De Wolf St., Dorchester.

## LIBRARY NOTES.

### RECENT ADDITIONS TO THE LIBRARY.

St. Mary's Falls Canal.

Allowable Pressures on Deep Foundations by E. L. Corthell.  
Isthmian Canal Report, 1907.

National Cement Users' Association, Report of Convention,  
1906.

FREDERIC I. WINSLOW, *Librarian.*

## PERSONAL NEWS.

Under this heading it is proposed to publish each month personal news relating to members of the Society. All such items of interest should be sent to the Secretary of the Excursion Committee by the first day of each month. The co-operation of members is asked to make this column a success, and they are urged to send in notes even when of a personal nature.—E. M. BLAKE, Secretary, Excursion Committee, 8 Beacon St., Boston.

Mr. Charles E. Wells has been appointed a division engineer in the service of the Board of Water Supply of New York City.

\* \* \*

At the annual meeting of the American Society of Civil Engineers held last week, Prof. George F. Swain was elected one of the Vice-Presidents and Mr. Dexter Brackett one of the Directors

\* \* \*

Mr. William T. Blunt, lately superintendent for George H. Breyman & Bros. on Boston Harbor work, has been appointed superintendent of sub-aqueous rock excavation on the Panama Canal.

## NEW ENGINEERING WORK.

(Under this head the Excursion Committee proposes to present each month a brief résumé of engineering work in progress in New England, as far as such information is readily obtainable. The assistance of members is desired, and items of interest will be gladly received. Such items are intended to include not only works of exceptional magnitude or containing novel features, but also engineering construction work of all kinds and all degrees of magnitude. Notes should be in the hands of the Committee not later than the 2nd Wednesday of each month. The thanks of the Committee are due to the members who have furnished data for the Bulletin.—E. M. BLAKE, Secretary, Excursion Committee, 8 Beacon St., Boston.)

**Commonwealth of Massachusetts.**—CHARLES RIVER BASIN COMMISSION.—Sluice gates for filling and emptying the locks are being erected in the main lock gates and operating machinery is being set up.

The Boston Marginal Conduit is completed from the dam nearly to Otter Street, and the trench for the conduit is being sheeted between Berkeley and Essex Streets.

The time for receiving bids to construct the last section of the Boston Marginal Conduit and the Embankment has been extended to Jan. 20, 1908.

**METROPOLITAN WATER AND SEWERAGE BOARD.**—*Sewerage Works.*—Work is in progress on about four and one-half miles of trunk sewer on the extension of the high level sewers in Brookline and Brighton. A large part of the work is by tunnel, and much involves the use of compressed air.

**Boston Transit Commission.**—It is expected that the following Washington-Street Tunnel work will be in progress about Jan. 15, 1908: Construction of open incline at the rear of the Relief Station; covering with tile finish the walls and part of ceilings of stations between LaGrange and Franklin Streets; putting in granolithic surface on the station platforms of the Tunnel.

**Boston & Albany Railroad.**—**ABOLITION OF GRADE CROSSINGS.**—*East Boston Grade Crossing.*—This work is so far completed that the railroad traffic is being carried on on the new location for its whole length. The street work is completed except on Summer and Webster Streets. The masonry for the Summer Street bridge is finished, but the bridge superstructure is not yet in place. A foot bridge is to be built on Webster Street.

**Boston Elevated Railway.**—**ELEVATED AND SUBWAY CONSTRUCTION.**—*Forest Hills Extension.*—The steel structure for the new Egleston Square Station, furnished by the New England Structural Co., is practically erected.

*South Approach, Washington-Street Tunnel.*—Steel structure connecting present structure at Castle Street to the new Washington-Street Tunnel is erected and being painted. Oak and Ash Streets have been lowered and all alterations to property made necessary by these grade changes have been completed.

*East Cambridge Extension.*—Construction on this extension has been going on for a short time, and portions of the foundations for the piers supporting the proposed new elevated railway bridge across the lower or down stream slope of the Charles River dam have been constructed on both sides of the large ship lock, and work is under way on others on the East Cambridge side of the river adjoining the small boat lock and sluices.

**DEPARTMENT MOTIVE POWER AND ROLLING STOCK.**—*Central Power Station.*—Work on the intake tunnel is completed, and the tunnel is now in service.

**City of Boston.**—**ENGINEERING DEPARTMENT.**—*Northern Avenue Bridge.*—The approaches are practically complete. The fixed spans are complete except paving of roadways and surfacing of sidewalks. The steel work of the draw is being erected. The

draw track (base of casting at Grade 5 feet 11 inches City Base) is set within a circular dam of granite and concrete masonry which excludes the tide.

**Cambridge, Mass.** — ENGINEERING DEPARTMENT. — *Commercial Avenue Bridge over Lockmere Canal.* — This is a draw-bridge, Scherzer Rolling Lift design, carried on two concrete piers. The bridge is 55 feet between railings, the clear opening of the draw is 40 feet 6 inches. The piers, foundations, walls and fenders are now practically completed. Hugh Farrell of Somerville, contractor. The steel superstructure is now being erected by the contractor, the Boston Bridge Works Incorporated, and is now in good condition for inspection. The total cost of the bridge will be about \$55,000.

**Newton, Mass.** — Extensions of the sewer system in Waban and at Newton Highlands are now under way. At the latter place the work consists of a 20 inch by 30 inch concrete sewer which is being constructed in tunnel under Cook Street. Four headings are now in progress, two with rock to the roof of the tunnel, one in quicksand and one tunnel in hardpan. A pneumatic plant has here been installed for the operation of the machinery, and there is in use a novel hoist operated by one horse.

At Waban, a crossing of the sewer under the Cochituate Aqueduct in quicksand is just being completed, and the forces are about to undertake a similar crossing under the tracks of the Boston & Albany Railroad, which will involve some interesting engineering features. All of the above work is being done by day labor under the management of the City forces.



# HEALEY SEWER MACHINE & CONSTRUCTION CO.

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**OFFICE: NEW YORK**

*Telephone Connection*

**P. J. HEALEY, Manager**

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**TANKS, STACKS, PENSTOCKS, CONCRETE FORMS  
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**Main Office and Works**

**SO. FRAMINGHAM, MASS.**

**Boston Office**

**170 SUMMER ST.**

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fication and Sewage Disposal Plants.

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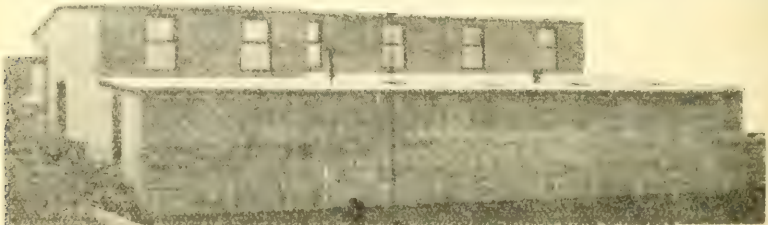
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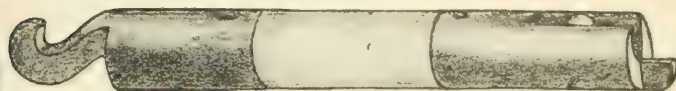
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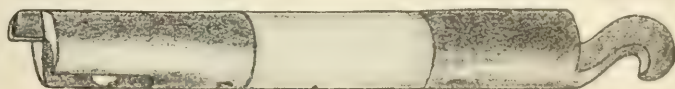
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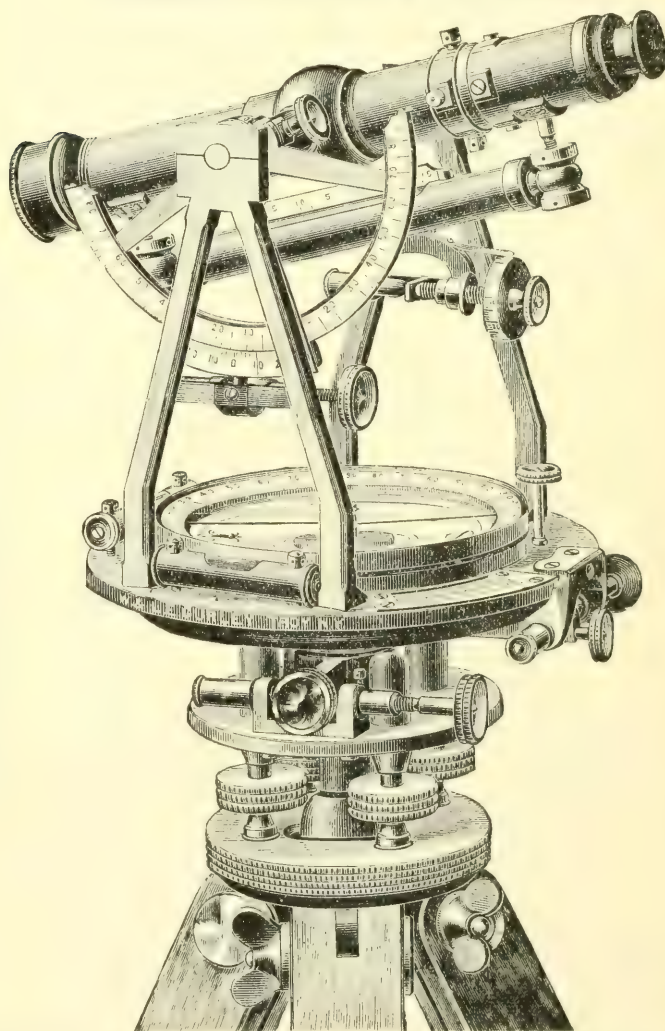
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# BOSTON SOCIETY OF CIVIL ENGINEERS.

ORGANIZED JULY 3, 1848.

## MONTHLY BULLETIN.

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NEW SERIES.

FEBRUARY, 1908.

No. 19.

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### REGULAR MEETING.

A regular meeting of the Boston Society of Civil Engineers will be held on Wednesday, Feb. 19, 1908, at 7.30 o'clock P. M., in

LORIMER HALL, TREMONT TEMPLE, BOSTON.

BUSINESS OF THE MEETING: To ballot on the applications for membership as announced in this notice.

At eight o'clock a joint meeting will be held with the Appalachian Mountain Club at which Mr. Allen Hazen will describe "A Short Trip in Australia," illustrated by lantern slides. The slides show something of the Brisbane Water Works, the Sydney Water Works and the Melbourne sewerage and sewage disposal, although the greater number of them are general pictures, including quite a number relating to railway matters.

A most cordial invitation is extended to *ladies* to be present at this meeting.

S. E. TINKHAM, *Secretary*.

### EXCURSION.

There will be an excursion on Wednesday, Feb. 19, 1908, to the Lawrence & Wiggin wharf, Charlestown, now under construction.



Members are expected to be on the ground at 2 p. m. If the weather is unfavorable, the excursion will be held on the next fair day. Take Bunker Hill car to Elm Street, Charlestown, and enter the Lawrence & Wiggin lumber yard from Medford Street. Pass through yard to the wharf. One-half hour's ride from Adams Square. An account of this work will be found among the items in "New Engineering Work."

#### EXCURSION COMMITTEE.

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### SANITARY SECTION MEETING.

The annual meeting of the Sanitary Section will be held Wednesday evening, March 4, at 7.30 o'clock. At this meeting reports of the various committees of the Section will be received and officers elected for the ensuing year.

It is expected that Prof. Olin H. Landreth will speak upon the disposal of wastes from pulp mills.

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### ANNUAL DINNER.

Arrangements are being made for the 26th Annual Dinner, to take place at Hotel Vendome, Boston, Tuesday evening, March 10, 1908. A circular giving full information will be sent later.

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### BINDING THE JOURNALS.

Members who wish the Secretary to attend to the binding of their numbers of the *Journal* are requested to send them to Room 715, Tremont Temple, Boston, before MARCH 20.

Arrangements have been made by which members can have the *two* volumes bound in *one* for 70 cents, or each volume bound separately for 40 cents each; the style of binding to be the same and uniform with that of former years. Mark clearly which way it is desired the binding shall be done.

---

### MEMBERSHIP CARDS.

The membership cards for 1908 are now ready for distribution and one will be mailed to any member who applies to the Secretary for it.

## CANDIDATES FOR MEMBERSHIP.

To be balloted on at meeting, Feb. 19, 1908.

### AS MEMBERS.

**THOMAS GEORGE HAZARD, JR.**, Narragansett Pier, R. I., (b. 1862). Educated at Brown University. Has conducted a general civil engineering business at Narragansett Pier since about 1887; has been town surveyor and engineer for Town of Narragansett since 1890. Is at present engaged in civil engineering, and since February, 1902, superintendent, Narragansett Pier Railroad. Recommended by Williard Kent, C. W. Sherman, J. C. Whitney and E. W. Howe.

**WALTER TOBIAS WILEY**, Boston, (b. 1885). Graduated from Dorchester High School in 1903 and from its post graduate course in 1904. In June, 1905, entered the employ of D. W. Hyde, surveyor, in May, 1906, entered the employ of the Boston Elevated Ry. Co., during summer of 1907, had charge of party in base line survey, and is now with same company in the Department of Elevated and Subway Construction, rating as transitman. Recommended by E. R. Kimball, A. F. Brown, G. A. Kimball and E. R. Olin.

**DANA MELVIN WOOD**, Belmont, Mass., (b. 1884). Student at Mass. Institute of Technology, September, 1902, to February, 1907, taking regular course in civil engineering and special subjects in sanitary engineering. From July to September, 1901, rodman, Brockton Canal Survey; June to September, 1903, rodman on Mass. Town Boundary Surveys; summer of 1904, rodman for Town of Brookline; July to September, 1905, rodman, U. S. Geological Survey, on surveys of several rivers and lakes in Maine; June and July, 1906, assistant engineer, N. Y. Board of Water Supply, leaving on account of severe illness; August to October, 1906, assistant engineer for Robert Spurr Weston on new water supply for hospital, Gravenhurst, Canada; January to August, 1907, hydrographic aid, U. S. Geological Survey; and at latter date promoted to junior hydrographer, which position he now holds. Recommended by H. K. Barrows, C. B. Breed, A. H. French and F. W. Hodgdon.

## APPLICATIONS FOR MEMBERSHIP.

The following applications for membership have been received and are now before the Board of Government for approval. Members having information which will assist the government in its consideration of these applications are requested to communicate at once with any member of the Board. Communications will be regarded as confidential and for the use of the Board alone.

### AS MEMBERS.

**WILLIAM WINTHROP CHURCHILL**, Milton, Mass., (b. 1866). Educated in the public schools of Milton and at Harvard University. Started in the

engineering and surveying profession with the New England Tel. & Tel. Co. as rodman for about 6 months and from there went into the office of E. W. Bowditch, C. E., and remained 5 years, going through the various grades to engineer in charge of work. Began general practice as engineer and surveyor in 1896, with an office in Milton where he is still located, chiefly in the employ of the town. Elected to Board of Assessors in Milton in 1903 for a 3 years' term and re-elected in 1906. Is still actively engaged as an engineer and surveyor, at present being with the Water Department of Milton, locating their work and systemizing their office records. Recommended by W. M. Brown, E. W. Bowditch, G. A. Kimball and D. A. Ambrose.

HAROLD PHILLIPS FARRINGTON, Boston, (b. 1885). Graduate Massachusetts Institute of Technology in 1907. Employed at present as designer and draftsman by Holbrook, Cabot & Rollins, Corporation, recommended by G. F. Swain, C. F. Allen, J. W. Rollins, Jr., and J. A. Holmes.

HOWARD G. HARRISON, Newton, Mass., (b. 1884). Graduate Cornell University in 1907 with degree of C. E. Summers of 1903 and 1905 rodman in service of city of Newton, and at present inspector for said city on sewer construction. Recommended by I. T. Farnham, I. W. Hastings, W. P. Morse and J. H. Kimball.

JOHN FERDINAND PETERSON, Cambridge, (b. 1879). Graduate Civil Engineering Dept., Tufts College, in 1907. Entered the employ of Mount Auburn Cemetery first as assistant engineer, and in November, 1907, was appointed assistant superintendent, which position he now holds. Recommended by F. B. Sanborn, C. D. Bray, J. J. Phelan and L. M. Hastings.

CHARLES SAMUEL TINKHAM, Boston, (b. 1880). Attended Mechanics Arts High School 1897 and 1898, and graduated from Massachusetts Agricultural College in 1903. Rodman with Metropolitan Sewerage Commission summers of 1901 and 1902; transitman with Mass. Highway Commission summer of 1903, and is still with that Commission. Now resident engineer in charge of construction of state roads. Recommended by A. B. Fletcher, W. E. McClintock, A. M. Lovis and E. W. Hadcock.

## RECOMMENDATION FOR HONORARY MEMBERSHIP.

Under authority of By-law 7, the entire Board of Government recommends for honorary membership in the Society:—

JOSEPH PHINEAS DAVIS, of Yonkers, N. Y. He was born at Northboro, Mass., in 1837, and was graduated from the Rensselaer Polytechnic Institute in 1858. He was an assistant engineer on the construction of the Brooklyn water works; was engaged on the construction of railroads and river improvements for the Peruvian government (1860-63); engineer in charge of the construction of Prospect Park in Brooklyn (1863-67); principal assistant engineer of the construction of the new water works for St. Louis, (1867-70) and chief engineer of the Lowell water works, (1870-71). He was appointed to make examinations for a new water sup-

ply for Boston in 1871, and in 1872 was elected city engineer of Boston, which position he held until 1880. During this period in addition to supervising all the city's engineering work, he had charge of the construction of the Sudbury River Aqueduct and the Main Drainage Works. Since 1880 he has been the engineering adviser of the Bell Telephone Co., and the work of placing the telephone wires under ground was done according to his plans and under his supervision. He was consulting engineer to the New York Aqueduct Commission on the design and construction of the new Croton Aqueduct and the storage reservoirs in the Croton Valley. For many years he has been the consulting engineer for the Massachusetts State Board of Health and of the Metropolitan Water Board. He has been a member of the American Society of Civil Engineers since Jan. 29, 1868, and its vice-president in 1884. He was elected a member of this society June 8, 1874, and is its oldest living past president, having held that position in 1880.

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### SOCIETY OF ARTS MEETING.

Through the courtesy of the Secretary of the Society of Arts announcement is made of the following meeting of that Society:—

Feb. 27, 1908, Mr. Charles B. Burleigh, Engineer of the General Electric Company, will speak on "Steam Turbines."

The meeting is held at 8 o'clock, in Room 22, Walker Building, Massachusetts Institute of Technology, Boylston and Clarendon Streets. All interested in the subjects are invited to attend.

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### MEETINGS OF THE BOSTON SECTION, AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS.

A meeting of the Boston Section of the American Institute of Electrical Engineers will be held on Wednesday evening, Feb. 19, 1908, at 8 o'clock, in the Auditorium of the Edison Electric Illuminating Company of Boston. This room is on the third floor of the new Edison Building, at 39 Boylston Street, Boston, between Tremont and Washington Streets.

Mr. D. Du Bois, of the General Electric Company, Schenectady, N. Y., will deliver an address, illustrated by lantern slides, on "The Latest Development of Lightning Protection."

Non-members are cordially invited to attend these meetings, and any such desiring regular notices are requested to communicate with the Secretary.



## MINUTES OF MEETING.

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### JANUARY MEETING OF THE SOCIETY.

BOSTON, JAN. 22, 1907. — A regular meeting of the Boston Society of Civil Engineers was held at Chipman Hall, Tremont Temple, at 8 o'clock P. M.; President E. W. Howe in the chair; one hundred and fifteen members and visitors present.

The record of the last meeting was read and approved.

Messrs. William H. Balch, Thomas F. Campbell, Albion M. Deane, Walter J. Grady, Angus B. MacMillan and Arthur D. Weston were elected members of the Society.

On motion of Mr. A. H. French, the President was requested to appoint a committee of three to retire and report to the meeting the names of five members to serve as a committee to nominate officers for the ensuing year. The President named as that Committee, Messrs. A. H. French, R. A. Hale, and J. A. Gould. This Committee reported the following names for members of the nominating committee, Arthur L. Plimpton, Leonard C. Wason, John L. Howard, Henry B. Wood and Charles W. Sherman. On motion of Mr. F. P. Stearns, the report was accepted and the members named were chosen as the nominating committee.

On motion of Mr. FitzGerald, it was voted to hold the customary annual dinner and that the usual committee (Mr. Henry Manley) be appointed to make the necessary arrangements.

The literary exercises of the evening consisted of a description of the Double Track Railroad Tunnel under the Detroit River at Detroit. Mr. H. A. Carson gave an historical account of various methods which had been used for the construction of similar tunnels and described plans which had been suggested for the building of this tunnel, illustrating his remarks by the aid of lantern slides. Mr. William J. Wilgus of New York, Chairman of the Advisory Board of Engineers, was then introduced and gave a most interesting account of the plan finally adopted for the Detroit Tunnel and of the work of construction now in progress. A large number of views were thrown on the screen showing various stages of the work.

On motion of Mr. F. P. Stearns, the thanks of the Society were voted to Mr. Wilgus for his kindness.

Adjourned.

S. E. TINKHAM, *Secretary.*

## LIST OF MEMBERS.

## ADDITIONS.

THOMAS F. CAMPBELL	.	City Engineer's Office, Providence, R. I.
WILLIAM L. CHURCH	.	176 Federal St., Boston.
WALTER J. GRADY	.	11 Milk St., Providence, R. I.
ANGUS B. MACMILLAN	.	117 Davis Ave., Brookline.

## CHANGES OF ADDRESS.

W. L. BLOSSOM	.	122 Davis Ave., Brookline.
W. T. BLUNT	.	La Boca, Canal Zone, Panama.
N. S. BROCK	.	2 Mt. Vernon Pl., Boston.
E. M. FRENCH	.	226 Baltic St., Brooklyn, N. Y.
E. A. TAYLOR	.	Uxbridge, Mass.

## LIBRARY NOTES.

## RECENT ADDITIONS TO THE LIBRARY.

Gilbreth's Field System.

Large Tunnel Shafts. J. H. W. Buck.

Boundary Lines of Lowell, Ayer, etc.

Connecticut Railroads, 1907.

Annual Report, Boston Street Dept., 1906.

Annual Reports, North Brookfield, Mass., Water Commissioners, 1894 to '98, 1899 to 1906.

Annual Reports, Detroit, Mich., Water Commissioners, 1906, 1907.

Annual Reports, City Departments, Keene, N. H.

Annual Report, Fall River, Mass., Water Board, 1907.

Annual Reports, Needham, Mass., Water Commissioners, 1898, 1899; 1901-1906.

All of the hand-books such as Trantwine, Kent, Kidder, etc., have been placed on the large table in the middle room.

FREDERIC I. WINSLOW, *Librarian*.

## PERSONAL NEWS.

Under this heading it is proposed to publish each month personal news relating to members of the Society. All such items of interest should be sent to the Secretary of the Excursion Committee by the first day of each month. The co-operation of members is asked to make this column a success, and they are urged to send in notes even when of a personal nature.—E. M. BLAKE, Secretary, Excursion Committee, 8 Beacon St., Boston.)

Mr. James L. Tighe has been re-appointed City Engineer of Holyoke, Mass. for a 3-year term.

Mr. X. H. Goodnough, a member of the Society, and Drs. J. W. Bartol and Charles Harrington, members of the Sanitary Section, have been appointed by the Boston Finance Commission members of a special commission to consider the condition of the Health Department of the City of Boston.

\* \* \*

Mr. Charles W. Aiken has resigned as chief engineer of the Proctor & Gamble Co., Cincinnati, New York and Kansas City, and with Mr. Earnest Houchin has formed a corporation known as Houchin—Aiken Co., Engineers and Machinists, Brooklyn and New York. The new firm has acquired the plant of Messrs. Houchin and Huber.

## NEW ENGINEERING WORK.

(Under this head the Excursion Committee proposes to present each month a brief résumé of engineering work in progress in New England, as far as such information is readily obtainable. The assistance of members is desired, and items of interest will be gladly received. Such items are intended to include not only works of exceptional magnitude or containing novel features, but also engineering construction work of all kinds and all degrees of magnitude. Notes should be in the hands of the Committee not later than the 2nd Wednesday of each month. The thanks of the Committee are due to the members who have furnished data for the Bulletin.—E. M. BLAKE, Secretary, Excursion Committee, 8 Beacon St., Boston.)

**Commonwealth of Massachusetts.**—CHARLES RIVER BASIN COMMISSION.—Miscellaneous work is being carried on at the dam on the lock gate and bridge.

Work on the basin and Cambridge and Boston Marginal conduits has been suspended for the winter.

**Boston Transit Commission.**—It is expected that the Washington-Street Tunnel work which will be in progress about Feb. 15, 1908, will consist mainly of interior finish, such as surfacing the platform, putting tiles on the walls, making balustrades, etc.

**Boston & Albany Railroad.**—*Beacon Park Engine House.*—Foundations for thirty stall engine house, 90 feet deep, are nearly completed. Foundations are of concrete, partly reinforced. In order to reach hard bottom it was necessary to carry foundations to a depth of 13 or 14 feet. The walls of superstructure will be built of re-enforced concrete, and this work will start early in the spring.

*Third Track Hinsdale to Dalton.*—New third track about four miles in length, will be laid from Hinsdale to Dalton. Work is now in progress on rock excavation and concrete retaining walls and culvert extensions.

*Third Track — Brookview to Van Hoesen.*—Track is laid and is being operated over. The contractor is at work finishing up concrete retaining walls.

*Engine House and Machine Shop.—Pittsfield and North Adams Junction.*—Engine house and machine shop are completed, ready for equipment. Contract has been let for boilers and piping consisting of water, steam and air pipes.

*Improvements at Riverside.*—New concrete ash pit and locomotive crane for handling ashes and coaling engines have been installed. Sixty-five thousand gallon water tank and two ten-inch standpipes are installed and in use. Work is in progress on fifty thousand gallon water tank and two ten-inch standpipes.

**Boston Elevated Railway.**—ELEVATED AND SUBWAY CONSTRUCTION—*Forest Hills Extension.* No work under construction at present time, plans in preparation for the further extension of present structure to Walk Hill Street, also the station in Forest Hills Square.

*Washington Street Tunnel, South Approach.*—Some steel structure is being erected north of Oak Street on the incline, and plans are in preparation for the continuation of the reinforced concrete incline to connect with the subway at Nassau Street.

*East Cambridge Extension, Charles River Bridge.*—The new bridge under construction on the northerly side of the proposed Charles River Dam will be about 1,780 feet long.

There are to be twelve spans varying from about 49 feet, which is the draw span, to 125 feet, 4 inches.

Piers are to be of concrete to grade two, granite backed with concrete to grade 26 and the superstructure of reinforced concrete.

The ten water piers for the bridge are now under construction by the Holbrook, Cabot & Rollins Corporation.

**Boston and Maine Railroad.**—The separation of grades at Waltham has been approved by the Railroad Commission at an estimated cost of \$960,000. The change involves raising the tracks of the Fitchburg Division for about two miles and one-half and the building of two stone arch bridges and five steel girder bridges. The station will have two stories, one floor at the street level and one at the level of the tracks. The scheme includes a subway under the tracks which will do away with any necessity of crossing the tracks by passengers.



**Boston.**—Simpson Bros. Corporation are finishing two re-inforced concrete buildings with connecting boiler and engine rooms for Torrey & Co. on Medford and Beverly Streets. The Beverly Street building is 75 feet by 120 feet, six stories high, and the Medford Street building 75 feet by 78 feet, five stories high. Concreting on Beverly Street building above foundations was begun October 15th, and finished in January, with the exception of granolithic floors. These floors are laid 1 inch thick and bonded to the concrete slab by special treatment. The contractors would be pleased to show these buildings to members of the society who are interested in concrete construction.

**Charlestown, Mass.**—The Lawrence & Wiggin wharf is situated on Mystic River, adjoining the Mystic Wharf of the Boston & Maine Railroad. This wharf, which is about 700 feet long, 135 feet in width, and having an area of 100,000 square feet, is built on piles, and is designed to carry a load of 1,000 pounds to the square foot.

A portion of the wharf is ultimately to be filled, a bulkhead being provided in the construction of the wharf to retain the filling. The portion of the wharf that is to be filled is built on chestnut piles, the outer portion on oak piles.

The total number of piles will be approximately 3,000. These piles have been all bought, and most of them cut, since the first of October. They vary in length from 30 feet to 70 feet. There will be about 1,000,000 feet of lumber in the wharf.

Work on the wharf commenced Oct. 14, 1907. Since that time there have been driven about 2,100 piles and about 600,000 feet of lumber placed in position.

Upon this wharf is being constructed a shed, containing an area of about 93,000 square feet; which shed is to be divided into three parts by fire walls, and will require about 600,000 feet of lumber in its construction.

The lumber for the wharf and shed is all Florida hard pine, of "prime" quality. The major part of this lumber was in standing trees in September, 1907.

In connection with this wharf, 80,000 cu. yards of dredging was done between November 1st and January 15th, making a berth on the north side 700 feet in length, 70 feet in width on the bottom, with an average of 27 feet of water at low water, and a berth on the east end 142 feet in length, 50 feet in width on the bottom, with an average depth of 25 feet at low water, and a turning basin with 18 feet of water at low water.

The wharf is arranged for railroad tracks on each side ; the posts of the shed set back from the face of the shed, similar to the sheds at the Hoosac Tunnel Docks.

The wind-bracing presents some novel features, as provision had to be made for heavy gales sweeping down the Mystic River.

All lumber for wharf and sheds and all piling furnished by Lawrence & Wiggin.

The wharf is being built by Thomas E. Ruggles under a contract dated Oct. 2, 1907.

The dredging was done by the Eastern Dredging Company, under a contract dated Oct. 23, 1907, and the sheds are being built by Mead, Mason & Company, under a contract dated Jan. 8, 1908. If the inclement weather of the past two weeks had not interfered, the first section of the sheds would have been completed by February 15th.



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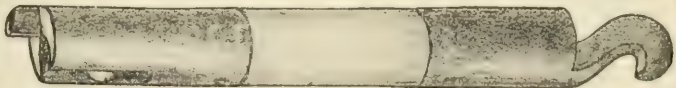
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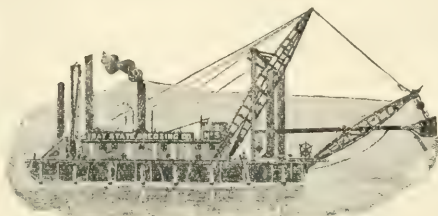
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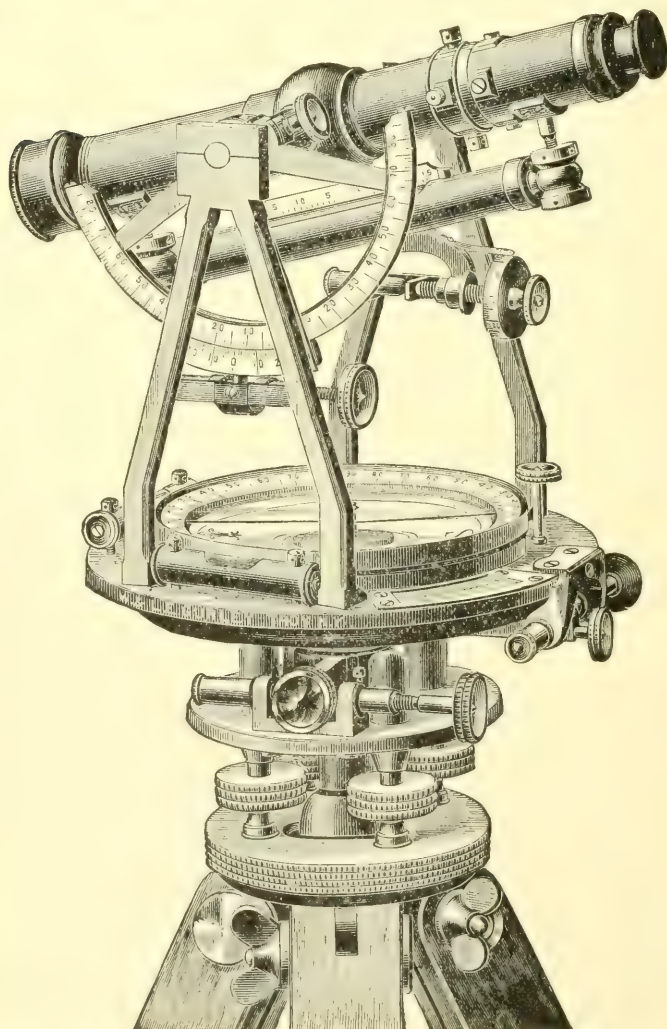
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# MONTHLY BULLETIN.

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NEW SERIES.

MARCH, 1908.

No. 20.

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## ANNUAL MEETING.

The annual meeting of the Boston Society of Civil Engineers will be held on Wednesday evening, March 18, 1908, in

CHIPMAN HALL, TREMONT TEMPLE, BOSTON.

The meeting will be called to order *promptly at half past seven o'clock*, so that there may be ample time for the business and the illustrated paper.

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**BUSINESS:** To ballot on the applications for membership as announced in this notice.

To receive the annual reports of the Board of Government, of the Treasurer, and of the Secretary.

To receive the annual reports of the several special committees of the Society.

To reappoint the several special committees.

Announcement of result of letter-ballot for officers for the ensuing year.\*

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Mr. William F. Williams will read a paper entitled, "The Abolition of Grade Crossings in New Bedford." The paper will be illustrated by lantern slides.

S. E. TINKHAM, *Secretary*.

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\* Letter-ballots will be received until 8 o'clock P. M. of March 18, 1908.



## INFORMAL MEETINGS.

An informal meeting will be held in the Society's Library, 715 Tremont Temple, on Wednesday evening, April 8, 1908, at 7.45 o'clock.

Prof. George F. Swain will discuss the Quebec Bridge Disaster.

## BINDING THE JOURNALS.

Members who wish the Secretary to attend to the binding of their numbers of the *Journal* are requested to send them to Room 715, Tremont Temple, Boston, before MARCH 20.

Arrangements have been made by which members can have the *two* volumes bound in *one* for 70 cents, or each volume bound separately for 40 cents each; the style of binding to be the same and uniform with that of former years. Mark clearly which way it is desired the binding shall be done.

## MEMBERSHIP CARDS.

The membership cards for 1908 are now ready for distribution and one will be mailed to any member who applies to the Secretary for it.

## CANDIDATES FOR MEMBERSHIP.

To be balloted on at meeting, March 18, 1908.

### AS HONORARY MEMBER.

JOSEPH PHINEAS DAVIS, of Yonkers, N. Y. He was born at Northboro, Mass., in 1837, and was graduated from the Rensselaer Polytechnic Institute in 1856. He was an assistant engineer on the construction of the Brooklyn water works; was engaged on the construction of railroads and river improvements for the Peruvian government (1860-63); engineer in charge of the construction of Prospect Park in Brooklyn (1863-67); principal assistant engineer of the construction of the new water works for St. Louis, (1867-70) and chief engineer of the Lowell water works, (1870-71). He was appointed to make examinations for a new water supply for Boston in 1871, and in 1872 was elected city engineer of Boston, which position he held until 1880. During this period in addition to supervising all the city's engineering work, he had charge of the construction of the Sudbury River Aqueduct and the Main Drainage Works. Since 1880 he has been the engineering adviser of the Bell Telephone Co., and the work of placing the telephone wires under ground was done according to his plans and under his supervision. He was consulting engineer to the New York Aqueduct Commission on the design and construction of the new Croton Aqueduct and the storage reservoirs in the Croton Valley. For many years he has been the consulting engineer for the Massachusetts State Board of Health and of the Metropolitan Water Board. He has been a member of the American Society of Civil Engineers since Jan. 29, 1868, and its vice-president in 1884. He was elected a member of this society June 8, 1874, and is its oldest living past president, having held that position in 1880.

## AS MEMBERS.

WILLIAM WINTHROP CHURCHILL, Milton, Mass., (b. 1866). Educated in the public schools of Milton and at Harvard University. Started in the engineering and surveying profession with the New England Tel. & Tel. Co. as rodman for about 6 months and from there went into the office of E. W. Bowditch, C. E., and remained 5 years, going through the various grades to engineer in charge of work. Began general practice as engineer and surveyor in 1896, with an office in Milton where he is still located, chiefly in the employ of the town. Elected to Board of Assessors in Milton in 1903 for a 3 years' term and re-elected in 1906. Is still actively engaged as an engineer and surveyor, at present being with the Water Department of Milton, locating their work and systemizing their office records. Recommended by W. M. Brown, E. W. Bowditch, G. A. Kimball and D. A. Ambrose.

HAROLD PHILLIPS FARRINGTON, Boston, (b. 1885). Graduate Massachusetts Institute of Technology in 1907. Employed at present as designer and draftsman by Holbrook, Cabot & Rollins, Corporation, recommended by G. F. Swain, C. F. Allen, J. W. Rollins, Jr., and J. A. Holmes.

HOWARD G. HARRISON, Newton, Mass., (b. 1884). Graduate Cornell University in 1907 with degree of C. E. Summers of 1903 and 1905 rodman in service of city of Newton, and at present inspector for said city on sewer construction. Recommended by I. T. Farnham, I. W. Hastings, W. P. Morse and J. H. Kimball.

JOHN FERDINAND PETERSON, Cambridge, (b. 1879). Graduate Civil Engineering Dept., Tufts College, in 1907. Entered the employ of Mount Auburn Cemetery first as assistant engineer, and in November, 1907, was appointed assistant superintendent, which position he now holds. Recommended by F. B. Sanborn, C. D. Bray, J. J. Phelan and L. M. Hastings.

CHARLES SAMUEL TINKHAM, Boston, (b. 1880). Attended Mechanics Arts High School 1897 and 1898, and graduated from Massachusetts Agricultural College in 1903. Rodman with Metropolitan Sewerage Commission summers of 1901 and 1902; transitman with Mass. Highway Commission summer of 1903, and is still with that Commission. Now resident engineer in charge of construction of state roads. Recommended by A. B. Fletcher, W. E. McClintock, A. M. Lovis and E. W. Haddock.

## APPLICATIONS FOR MEMBERSHIP.

The following applications for membership have been received and are now before the Board of Government for approval. Members having information which will assist the government in its consideration of these applications are requested to communicate at once with any member of the Board. Communications will be regarded as confidential and for the use of the Board alone.

## AS MEMBERS.

DAVID ROY BATES, Newton, Mass., (b. 1877). Graduated from Worcester Academy in 1898. Employed by Pierce & Barnes, Boston, from 1898 to 1901; by E. W. Bowditch, Boston, from 1901 to 1902; by

H. J. Hinterleitner, Spangler, Pa., from 1902 to 1906; and since July, 1906, has been employed as Assistant Engineer by Boston Elevated Ry. Co. Recommended by G. A. Kimball, A. F. Brown, H. C. Hartwell, and L. S. Cowles.

AUSTIN CARY, Brunswick, Me., (b. 1865). Received from Bowdoin College degree of A. B. in 1887 and of A. M. in 1890. Taught biology and geology at Bowdoin College in 1887-8. Employee of Forestry Division, U. S. Department of Agriculture and Maine Forest Commission 1891-1896 intermittently; Forester, Berlin Mills Co., 1898-1904; land surveyor, timber explorer and topographer, before and after; and now Assistant Professor of Forestry, Harvard University, and member of firm of Fisher, Cary & Bryant, Foresters, 141 Milk Street, Boston. Recommended by A. E. Burton, A. G. Robbins, I. N. Hollis and H. J. Hughes.

JAMES HAWORTH EATON, Cambridge, (b. 1881). Graduated from University of Vermont in 1903. Studied civil engineering in Harvard University for three years. May, 1906, to February, 1907, instrument man on preliminary railroad location for Vermont Marble Co., and employed since February, 1907, by J. R. Worcester & Co. as designer of steel and reinforced concrete construction. Recommended by J. R. Worcester, E. E. Pettee, H. K. Barrows and L. J. Johnson.

JOHN ARTHUR GARROD, Somerville, Mass., (b. 1870). Graduated at Clewer House School, Windsor, England. Apprenticed in 1886 to E. Lawrence & Sons, contractors, London, 1886 to 1893; studied building construction, surveying and civil engineering at City of London College, Polytechnic and Technological Institutes, and passed the honors grade of the government science and art department examination in these subjects 1893. Superintendent and manager for London contracting firms till 1898, and then superintending engineering contracts in H. M. Dockyard, Chatham, till 1900. Came to United States America in 1900; employed by the Aberthaw Construction Co. as draughtsman, and since 1901 as general superintendent of construction. Recommended by L. C. Wason, Leonard Metcalf, R. S. Weston and G. D. Emerson.

TIMOTHY GUINEY, Boston, (b. 1879). Graduate of the English High School, Boston, and has had a two-year course in mechanical engineering at Lowell Institute. Worked one year as rodman for Metropolitan Park Commission; one year as rodman and one year as instrument man for the Charles River Basin Commission; and is now with same Commission as instrument man in charge of party. Recommended by J. N. Ferguson, J. A. Holmes, M. F. Sanborn and D. A. Ambrose.

J. HOWARD HAYES, Cambridge, (b. 1879). Educated at Cambridge Manual Training School, at Lowell Institute and a correspondence course in technical lines, also at Harvard Engineering Camp. Now partner F. H. Hayes Machinery Co., pumping and hydraulic machinery. Recommended by J. C. Chase, G. A. Kimball, F. A. Barbour and E. M. Blake.

HENRY MICHAEL McCUE, Lowell, Mass., (b. 1884). Graduate of Lowell High School, spent two years in civil engineering course at Mass. Institute of Technology, and has taken a course in mechanical engineering at Lowell Institute. Worked one year as rodman for Metropolitan Park Commission; one year as instrument man with Boston & Northern and Old

Colony Street Ry. Cos.; one year and a half as engineering inspector and instrument man in charge of party with Charles River Basin Commission, where he is at present. Recommended by J. N. Ferguson, J. A. Holmes, M. F. Sanborn and D. A. Ambrose.

FREDERIC LINCOLN MURRAY, Cambridge, (b. 1869). Educated in the Boston and Cambridge public schools. From 1892 to 1898 with the Smith-Carlton Iron Co., shop work and draughting; from 1898 to 1905 with C. H. Blackall, draughting and superintending erection of office building in Boston; from 1905 to 1906 with Peters & Rice superintending erection of building corner Franklin and Hawley Streets; from 1906 to 1907 with N. Y., N. H. & H. R. R., as inspector of concrete; and 1907 to date with J. R. Worcester & Co., designing and field inspection of concrete. Recommended by G. H. Brazer, J. R. Worcester, G. T. Sampson and L. L. Street.

EDGAR ALVA NORWOOD, Rockport, Mass., (b. 1884). Educated in public schools of Rockport and graduated from Tufts College with degree of B. S. in Mechanical Engineering in 1907. Entered employ of J. R. Worcester & Co., February, 1907, and where he is at present employed in draughting and designing steel and reinforced concrete buildings and bridges. Recommended by G. H. Brazer, E. E. Pettee, J. R. Worcester and F. B. Sanborn.

CHARLES COWIN TURNER, Quincy, Mass., (b. 1878). Graduated from Bath, Me., High School in 1896. From 1899 to 1902 with Bath Iron Works as draftsman; from 1902 to 1903 with the Geo. Lawley & Sons Corp. as draftsman; from 1903 to 1906 with the Fore River Shipbuilding Co., as draftsman; and from 1906 to present time with J. R. Worcester & Co., drawing and designing steel and concrete structures. Recommended by George H. Brazer, E. E. Pettee, J. R. Worcester and C. T. Fernald.

HOWARD EARLE WHITING, Cambridge, Mass., (b. 1871). Graduated from Cambridge High School 1890, attended Mass. Institute of Technology 1890-1891 and Lawrence Scientific School 1891 to 1895. Was Park Engineer and Superintendent of Parks, Cambridge, from 1895-1902; in business, 1902-1907, and from September, 1907, to present date with the Boston Elevated Ry. Co. as Assistant Engineer. Recommended by G. A. Kimball, A. F. Brown, H. C. Hartwell and L. S. Cowles.

## SOCIETY OF ARTS MEETINGS.

Through the courtesy of the Secretary of the Society of Arts announcement is made of the following meetings of that Society;—

March 26, 1908, Mr. Lumière of the Lumière North American Co. will speak on Color Photography, assisted by Mr. J. E. Brulatour.

April 9, Mr. G. R. Acheson of the Archeson Graphite Co. will speak on Deflocculated Graphite as a Lubricant. Mr. Acheson will receive the Rumford Medal on the 8th of April.

The meetings are held at 8 o'clock, in Room 22, Walker Building, Massachusetts Institute of Technology, Boylston and Clarendon Streets. All interested in the subjects are invited to attend



## MEETINGS OF THE NORTHEASTERN SECTION OF THE AMERICAN CHEMICAL SOCIETY.

The Northeastern Section of the American Chemical Society will hold its eighty-third regular meeting March 20, at eight o'clock P. M., at the Tech Union, at the foot of Garrison Street, Boston. Mr. B. H. Smith, Chief of the Food and Drug Inspection Laboratory, U. S. Appraisers' Stores, will present a paper upon "The National Food and Drugs Act." Mr. Charles A. Kraus of the Research Laboratory of Physical Chemistry of the Mass. Institute of Technology, will present a paper upon "The Properties of Metallic Substances when dissolved in Non-Metallic Solvents."

To reach the Tech Union, take Huntington Avenue Cars to Garrison Street and walk through Garrison Street two squares to the end of the street.

Visitors are always welcome at the meetings.

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## MINUTES OF MEETINGS.

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### FEBRUARY MEETING OF THE SOCIETY.

BOSTON, MASS., FEB. 19, 1908. — A regular meeting of the Boston Society of Civil Engineers was held at Lorimer Hall, Tremont Temple, at 7.45 o'clock P. M., President E. W. Howe in the chair. One hundred and twenty members and visitors present, including ladies.

On motion of Mr. J. C. Chase the reading of the records of the last meeting was dispensed with.

Messrs. Thomas G. Hazard, Jr., Walter T. Wiley and Dana M. Wood were elected members of the Society.

At 8 o'clock a joint meeting with the Appalachian Mountain Club was held and the President invited Mr. Gardner M. Jones, President of the Appalachian Mountain Club, to assume the chair.

Mr. Jones then presented the speaker of the evening, Mr. Allen Hazen, a member of both societies, who gave a very interesting description of "A Short Trip in Australia," which was illustrated by a large number of lantern slides.

Adjourned.

S. E. TINKHAM, *Secretary*.

## MARCH MEETING OF THE SANITARY SECTION.

The annual meeting of the Sanitary Section of the Boston Society of Civil Engineers was held at the Society rooms Wednesday evening, March 4, 1908, with thirty-five members present.

The report of the Executive Committee was read by the Chairman and was accepted and placed on file.

The report of the Run-off Committee was read by the Chairman of the Committee and was accepted and placed on file.

Upon motion of Mr. H. K. Barrows it was voted that the Run-off Committee be continued and that Messrs. Arthur T. Safford and William S. Johnson be added to the committee.

Upon motion of Mr. H. P. Eddy, it was voted that a committee of three be appointed by the Chair to collect sewerage statistics and prepare them for publication. The Chair appointed Messrs. H. P. Eddy, Bertram Brewer and Charles Saville as members of this committee.

The following officers were elected for the ensuing year :

Chairman, — William S. Johnson,

Vice-Chairman, — George A. Carpenter,

Clerk, — Irving T. Farnham.

Members of the Executive Committee :— Hector J. Hughes, Edgar S. Dorr, Charles R. Felton.

An illustrated talk upon the subject of water power was given by Mr. Arthur T. Safford.

WILLIAM S. JOHNSON, *Clerk.*

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## LIBRARY NOTES.

### RECENT ADDITIONS TO THE LIBRARY.

Annual Report, Ohio State Board of Health, 1906.

Annual Report, New Hampshire R. R. Commissioners, 1907.

Annual Report, Maine R. R. Commissioners, 1907.

American Society Civil Engineers, Transactions, Volume LIX.

McGraw's Electrical Engineers Hand Book.

Providence, R. I., Quarterly Report Dept. Public Works.

New York, Special Report on Street Cleaning & Waste Disposal.

U. S.—Annual Report Chief of Bureau of Steam Engineering, 1907.

New York Dept. Water Supply, Annual Report, 1905.

Haverhill, Mass., Board Water Commissioners, Annual Report, 1907.

Manchester, Mass., Report on Water Supply by D. Fitzgerald.

Winchester, Mass., Annual Report Water and Sewerage Board, 1907.

Boston, Sewer Dept. Annual Report, 1906.

Rochester, N. Y., Board of Public Works Annual Report, 1906.

Watertown, Mass., Annual Report Water Commissioners, 1907.

Binghampton, N. Y., Water Commissioners Annual Report, 1907.

Manchester, Mass., Annual Report Water Commissioners, 1907.

Reading, Mass., Annual Report Water Commissioners, 1907.

FREDERIC I. WINSLOW, *Librarian.*

## PERSONAL NEWS.

(Under this heading it is proposed to publish each month personal news relating to members of the Society. All such items of interest should be sent to the Secretary of the Excursion Committee by the first day of each month. The co-operation of members is asked to make this column a success, and they are urged to send in notes even when of a personal nature.—E. M. BLAKE, Secretary, Excursion Committee, 8 Beacon St., Boston.)

Mr. William F. Keene was recently elected City Engineer of Central Falls, R. I.

\* \* \*

Mr. George A. Carpenter was recently re-elected city engineer of Pawtucket, R. I.

\* \* \*

Capt. Christopher Harrison has been reappointed City Engineer of Everett, Mass.

\* \* \*

Mr. F. Herbert Snow has been elected a vice-president of the Engineers' Club of Central Pennsylvania.

\* \* \*

Mr. Howard A. Carson, Chief Engineer Boston Transit Commission, is on a two months' trip through California.

\* \* \*

Mr. James W. Rollins, Jr., has been elected a member of the corporation of the Massachusetts Institute of Technology.

Mr. E. W. Wiggin has been appointed superintendent of bridges and buildings of the N. Y., N. H. & H. R. R., with headquarters at New Haven.

\* \* \*

Dr. Rudolph Hering has been retained by the City of Milwaukee, Wis., to draw up plans and specifications for a garbage and refuse incineration plant.

\* \* \*

Mr. Paul Hansen has been elected secretary-treasurer of the Ohio Engineering Society, and Mr. R. Winthrop Pratt, chairman of the Sanitary Section of the same Society.

\* \* \*

Dr. E. L. Corthell is now in Brazil and will shortly make his headquarters at Rio Grande, in the State of Rio Grande do Sul, where he will have charge of the extensive harbor improvements for which he received a concession in 1906.

\* \* \*

Mr. Edmund M. Blake has recently associated with him Mr. Henry Allen Symonds, under the firm name of Blake and Symonds, in the practice of sanitary, hydraulic, municipal and gas engineering, with office at 8 Beacon Street, Boston. Mr. Symonds recently resigned the position of engineer and superintendent for the town of Athol, Mass., after reorganizing the department and reporting upon the general improvements to be carried out following the taking over by the town of the plant of the Athol Water Company. Mr. Blake has recently been re-elected president and appointed general manager of the Westford Water Company.

## NEW ENGINEERING WORK.

(Under this head the Excursion Committee proposes to present each month a brief résumé of engineering work in progress in New England, as far as such information is readily obtainable. The assistance of members is desired, and items of interest will be gladly received. Such items are intended to include not only works of exceptional magnitude or containing novel features, but also engineering construction work of all kinds and all degrees of magnitude. Notes should be in the hands of the Committee not later than the 2nd Wednesday of each month. The thanks of the Committee are due to the members who have furnished data for the Bulletin.—E. M. BLAKE, Secretary, Excursion Committee, 8 Beacon St., Boston.)

**Commonwealth of Massachusetts.** — **CHARLES RIVER BASIN COMMISSION.** — The contract for the southerly section of the Embankment has been awarded to Wm. H. Ellis, who is engaged in driving piles for gate chamber foundation at the Fenway and in building temporary flume to divert Stony Brook during construction.



Between Harvard Bridge and Berkeley Street preliminary work of pile driving and construction of coffer-dams for the Boston Marginal Conduit is going on.

Work at the dam is largely completed except the earth fill and preparations are being made to remove the Boston coffer-dam.

Work of building a syphon consisting of two forty-eight inch pipes under the Lechmere Canal is under way.

On the Cambridge Marginal Conduit piles are being driven and concrete placed south of Lechmere Canal.

**Boston Transit Commission.**—It is expected that the Washington Street Tunnel work which will be in progress about March 15, 1908, will consist mainly of interior finish; such as, surfacing the platform, putting tiles on the walls, making balustrades, etc. The wall finish at station is in general of white enamel and ceramic mosaic tiling, relieved by a six and one-half inch colored border at about the level of the eye. Many of the ceilings over the main station platform are also tiled with white ceramic mosaic. Name panels, etc., are set in colored ceramic mosaic tile, the color of panels, borders, etc., changing with the station.

**City of Boston.**—ENGINEERING DEPARTMENT.—*Northern Avenue Bridge, Over Fort Point Channel.*—The steel work of the draw span is assembled in position and is being riveted. Contracts have been made with the Ingersoll-Rand Co. for two electrically driven air compressors; with the Roberts Iron Works Co., Cambridge, for eight steel air receivers about 48 inches diameter by 15 feet long; with the Mead-Morrison Co., Cambridge, for two steam engines for turning the draw span, and with the Walworth Construction and Supply Co., Boston, for furnishing and installing the operating machinery. It is proposed to use compressed air under 200 pounds pressure for the whole operation of the draw. The structure will be turned through two independent sets of gearing by the two steam engines, operated by air instead of by steam, air brakes being provided to regulate the swinging. The ends of the four trusses are to be raised by eight cast steel levers lifted by air cylinders 16 inches in diameter. A centering device operated by a small air cylinder is to be used to bring the draw into exact position on closing. The air is to be compressed and stored in a power house located on the down stream end of the draw fender pier, this house to provide quarters, also, for the men who will operate the draw.

**Boston Elevated Railway.**—ELEVATED AND SUBWAY CONSTRUCTION.—*Forest Hills Extension.*—Work has begun upon the foundations for the continuation of the present structure

to Walk Hill Street. There are numerous changes to sewers and water pipes which are also underway.

*Washington Street Tunnel Connections.*—At the south approach, buildings are being demolished on Ash Street preparatory to the construction of foundations and steel structure. At the north approach, work has commenced upon the masonry inclines and foundations for the six tracks which are to enter the old subway and new Washington Street Tunnel at this point.

*East Cambridge Extension.*—The contractor has under construction 7 of the 10 water piers for the new bridge; dredging, pile driving, and the placing of sheeting is going on in a portion of them, and concrete and stone masonry work in the balance.

**Boston & Northern and Old Colony Street Railway Co.**—This Company is investigating about thirty-five (35) bridges over their entire lines, with regard to carrying much heavier cars than are now in use.

**Westford, Mass.**—The 50 H. P. Olds Horizontal Gas Engine, 40 to 60 H. P. Suction Gas Producer and 8 x 12 Smith-Vaile Vertical Triplex Pump installed by the Westford Water Company, have recently been tested. Several tests were made. The results of the 24-hour continuous pumping test, using anthracite pea coal, the fires being operated under exactly normal conditions without forcing, were most satisfactory. The plant ran without a break. At 80% of full load, the condition prevailing during the run, with an average delivery of 282.8 gallons per minute, against an average total head of 416.21 feet, including friction and suction, the duty, based on 100 pounds of coal actually burned in the producer, and figured with 1% slip on the foot pounds of work actually done by the pump end, was approximately 146,000,000.

**Wrentham, Mass.**—The Single 25 H. P. Mietz & Weiss Fuel Oil Engine, direct connected to an 8 x 10 Smith-Vaile Vertical Triplex Pump, has recently been tested. At three-quarters load, the condition prevailing during the test, with a delivery of 262.3 United States gallons per minute against an average total head of 197.88 feet, including friction and suction, the fuel oil consumption averaged 1.95 pounds per horse power per hour based on the horse power developed at the pump end.

**Wareham, Mass.**—The two 25 H. P. Mietz & Weiss Fuel Oil Engines, direct connected to two 8 x 10 Smith-Vaile Vertical Triplex Pumps, have recently been tested. At approximately three-quarters load, the condition prevailing during the test, with a combined delivery of 525 United States gallons per minute, against an average total head of 201.14 feet, including friction and suction, the fuel oil consumption averaged 1.93 pounds per horse power per hour based on the horse power developed at the pump end.

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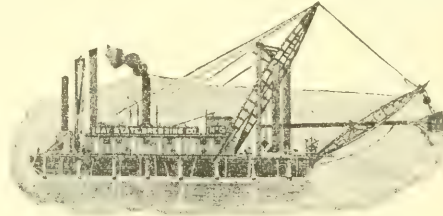
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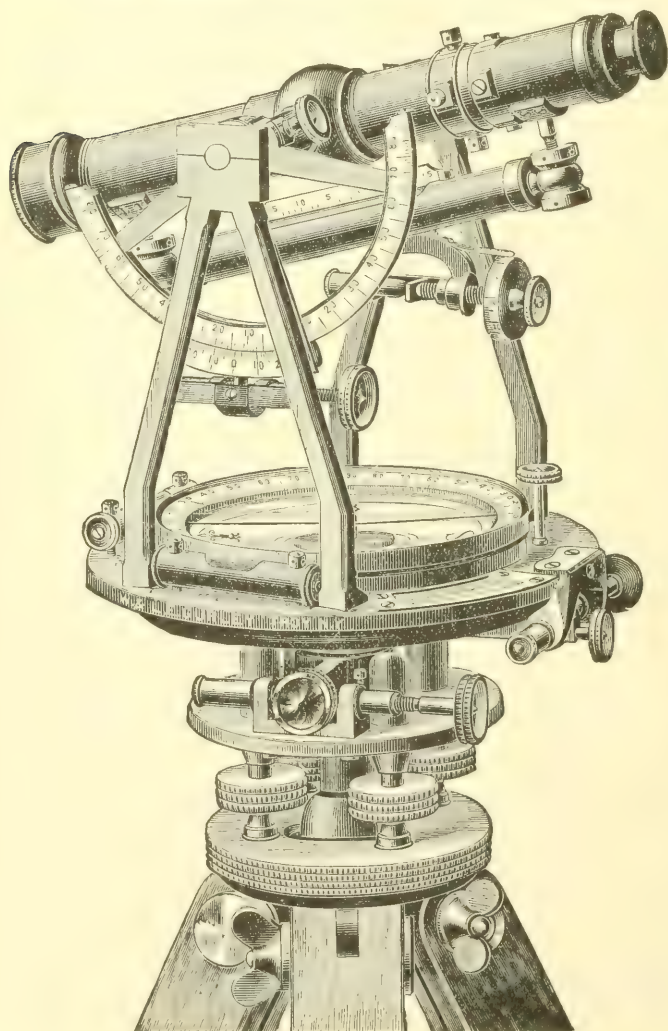
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# **BOSTON SOCIETY OF CIVIL ENGINEERS.**

**ORGANIZED JULY 3, 1848.**

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## **MONTHLY BULLETIN.**

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NEW SERIES.

APRIL, 1908.

No. 21.

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### **REGULAR MEETING.**

A regular meeting of the Boston Society of Civil Engineers will be held on Wednesday evening, April 15, 1908, in

CHIPMAN HALL, TREMONT TEMPLE, BOSTON.

Prof. George F. Swain will speak on some points in connection with the Quebec Bridge.

A large number of lantern slides relating to the bridge will be shown.

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**BUSINESS:** To ballot on the applications for membership as announced in this notice.

S. E. TINKHAM, *Secretary.*

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### **EXCURSION.**

There will be an excursion of the Society to inspect the work in progress at the Charles River Dam and at the Fenway on Wednesday afternoon, April 15th. Members will meet at the corner of Charles and Leverett Streets at 2 P. M. **EVERY MEMBER IS REQUESTED TO WEAR HIS EXCURSION BADGE.**

A brief description of the work in progress is contained in this number of the Bulletin under the head of "New Engineering Work." This work is at a very interesting stage in its construction.

The attendance at some of our excursions has not been as large as the Committee would like to see, and every member who can arrange to do so is urged to be present on April 15th.

**EXCURSION COMMITTEE.**



## CANDIDATES FOR MEMBERSHIP.

To be balloted on at meeting, April 15, 1908.

### AS MEMBERS.

DAVID ROY BATES, Newton, Mass., (b. 1877). Graduated from Worcester Academy in 1898. Employed by Pierce & Barnes, Boston, from 1898 to 1901; by E. W. Bowditch, Boston, from 1901 to 1902; by H. J. Hinterleitner, Spangler, Pa., from 1902 to 1906; and since July, 1906, has been employed as Assistant Engineer by Boston Elevated Ry. Co. Recommended by G. A. Kimball, A. F. Brown, H. C. Hartwell, and L. S. Cowles.

AUSTIN CARY, Brunswick, Me., (b. 1865). Received from Bowdoin College degree of A. B. in 1887 and of A. M. in 1890. Taught biology and geology at Bowdoin College in 1887-8. Employee of Forestry Division, U. S. Department of Agriculture and Maine Forest Commission 1891-1896 intermittently; Forester, Berlin Mills Co., 1898-1904; land surveyor, timber explorer and topographer, before and after; and now Assistant Professor of Forestry, Harvard University, and member of firm of Fisher, Cary & Bryant, Foresters, 141 Milk Street, Boston. Recommended by A. E. Burton, A. G. Robbins, I. N. Hollis and H. J. Hughes.

JAMES HAWORTH EATON, Cambridge, (b. 1881). Graduated from University of Vermont in 1903. Studied civil engineering in Harvard University for three years. May, 1906, to February, 1907, instrument man on preliminary railroad location for Vermont Marble Co., and employed since February, 1907, by J. R. Worcester & Co. as designer of steel and reinforced concrete construction. Recommended by J. R. Worcester, E. E. Pettie, H. K. Barrows and L. J. Johnson.

JOHN ARTHUR GARROD, Somerville, Mass., (b. 1870). Graduated at Clewer House School, Windsor, England. Apprenticed in 1886 to E. Lawrence & Sons, contractors, London, 1886 to 1893; studied building construction, surveying and civil engineering at City of London College, Polytechnic and Technological Institutes, and passed the honors grade of the government science and art department examination in these subjects 1893. Superintendent and manager for London contracting firms till 1898, and then superintending engineering contracts in H. M. Dockyard, Chatham, till 1900. Came to United States America in 1900; employed by the Aberthaw Construction Co. as draughtsman, and since 1901 as general superintendent of construction. Recommended by L. C. Wason, Leonard Metcalf, R. S. Weston and G. D. Emerson.

TIMOTHY GUINEY, Boston, (b. 1879). Graduate of the English High School, Boston, and has had a two-year course in mechanical engineering at Lowell Institute. Worked one year as rodman for Metropolitan Park Commission; one year as rodman and one year as instrument man for the Charles River Basin Commission; and is now with same Commission as instrument man in charge of party. Recommended by J. N. Ferguson, J. A. Holmes, M. F. Sanborn and D. A. Ambrose.

**HENRY MICHAEL McCUE**, Lowell, Mass., (b. 1884). Graduate of Lowell High School, spent two years in civil engineering course at Mass. Institute of Technology, and has taken a course in mechanical engineering at Lowell Institute. Worked one year as rodman for Metropolitan Park Commission; one year as instrument man with Boston & Northern and Old Colony Street Ry. Cos.; one year and a half as engineering inspector and instrument man in charge of party with Charles River Basin Commission where he is at present. Recommended by J. N. Ferguson, J. A. Holmes, M. F. Sanborn and D. A. Ambrose.

**FREDERIC LINCOLN MURRAY**, Cambridge, (b. 1869). Educated in the Boston and Cambridge public schools. From 1892 to 1898 with the Smith-Carlton Iron Co., shop work and draughting; from 1898 to 1905 with C. H. Blackall, draughting and superintending erection of office building in Boston; from 1905 to 1906 with Peters & Rice superintending erection of building corner Franklin and Hawley Streets; from 1906 to 1907 with N. Y., N. H. & H. R. R., as inspector of concrete; and 1907 to date with J. R. Worcester & Co., designing and field inspection of concrete. Recommended by G. H. Brazer, J. R. Worcester, G. T. Sampson and L. L. Street.

**EDGAR ALVA NORWOOD**, Rockport, Mass., (b. 1884). Educated in public schools of Rockport and graduated from Tufts College with degree of B. S. in Mechanical Engineering in 1907. Entered employ of J. R. Worcester & Co., February, 1907, and where he is at present employed in draughting and designing steel and reinforced concrete buildings and bridges. Recommended by G. H. Brazer, E. E. Pettee, J. R. Worcester and F. B. Sanborn.

**CHARLES COWIN TURNER**, Quincy, Mass., (b. 1878). Graduated from Bath, Me., High School in 1896. From 1899 to 1902 with Bath Iron Works as draftsman; from 1902 to 1903 with the Geo. Lawley & Sons Corp. as draftsman; from 1903 to 1906 with the Fore River Shipbuilding Co., as draftsman; and from 1906 to present time with J. R. Worcester & Co., drawing and designing steel and concrete structures. Recommended by George H. Brazer, E. E. Pettee, J. R. Worcester and C. T. Fernald.

**HOWARD EARLE WHITING**, Cambridge, Mass., (b. 1871). Graduated from Cambridge High School 1890, attended Mass. Institute of Technology 1890-1891 and Lawrence Scientific School 1891 to 1895. Was Park Engineer and Superintendent of Parks, Cambridge, from 1895-1902; in business, 1902-1907, and from September, 1907, to present date with the Boston Elevated Ry. Co. as Assistant Engineer. Recommended by G. A. Kimball, A. F. Brown, H. C. Hartwell and L. S. Cowles.

#### AS AN ASSOCIATE.

**J. HOWARD HAYES**, Cambridge, (b. 1879). Educated at Cambridge Manual Training School, at Lowell Institute and a correspondence course in technical lines, also at Harvard Engineering Camp. Now partner F. H. Hayes Machinery Co., pumping and hydraulic machinery. Recommended by J. C. Chase, G. A. Kimball, F. A. Barbour and E. M. Blake.

## APPLICATIONS FOR MEMBERSHIP.

The following applications for membership have been received and are now before the Board of Government for approval. Members having information which will assist the government in its consideration of these applications are requested to communicate at once with any member of the Board. Communications will be regarded as confidential and for the use of the Board alone.

### AS MEMBERS.

**CHARLES FREDERICK BREITZKE**, Newton, Mass., (b. 1884). Graduate in sanitary engineering course, Massachusetts Institute of Technology, in 1906. From June to Sept., 1906, was employed as temporary assistant engineer on New York Board of Water Supply: from Sept., 1906, to Jan., 1907, was in employ of John M. Farley, C. E., and in charge of reservoir construction at Mt. Kisco, N. Y.; from Jan. to April, 1907, was in employ of Hazen & Whipple as assistant on experimental work on aeration of water and sewage; in April, 1907, was appointed bacteriologist at Jerome Park Experiment Station under W. B. Fuller; in Sept., 1907, became Mr. Fuller's private assistant and was employed on work of the Passaic Valley Sewerage Commission: in Oct., 1907, was transferred to office of Hering & Fuller on same work; and Dec., 1907, was made assistant engineer with New York State Department of Health. Recommended by Theodore Horton, W. B. Fuller, Rudolph Hering and Charles Saville.

**MAURICE FRITCHLEY BROWN**, Winchester, Mass., (b. 1873). With Boston Bridge Works, June, 1899, to September, 1892, as office boy and draftsman; to June, 1894, student at Dartmouth College; to November, 1895, draftsman, Boston Bridge Works; to May, 1898, student Dartmouth College (B. S. 1897) and Thayer School of Civil Engineering (C. E. 1898), during this period working summers with the Boston Bridge Works. Since May, 1898, with the Boston Bridge Works as follows:—to January, 1900, as draftsman and assistant in estimating department; to May, 1900, in charge of estimating and designing; and from May, 1900, to date as chief engineer in general charge of all engineering and directly in charge of estimates and designs. Recommended by J. R. Worcester, E. E. Pettee, G. H. Brazer and F. H. Fay.

**HOWARD LINCOLN COBURN**, Boston, (b. 1867). Entered Mass. Inst. of Tech. 1883, leaving in 1885 to go to work. Until 1896 draftsman and assistant mechanical engineer with the late Charles Carr of Boston. Re-entered Mass. Inst. of Tech. in 1896 and was graduated in 1898. From 1898 to 1904, various engineering works, including power plant design; since 1904, chief engineer with Ambursen Hydraulic Construction Co. of Boston, in charge of all designs of reinforced concrete dams and power houses, etc. Recommended by R. S. Weston, R. A. Hale, H. F. Bryant and H. K. Barrows.

**ARTHUR WALLACE EMERSON**, Boston, (b. 1878). Educated in public schools of Milford, N. H. From 1900 to 1902 with Boston Bridge Works as draftsman; from 1902 to 1904 with Purdy and Henderson as draftsman;

and from 1904 to date with J. R. Worcester & Co., drawing and designing steel and concrete structures and inspection of all classes of steel work. Recommended by G. H. Brazer, E. E. Pettee, J. R. Worcester and J. C. Moses.

GEORGE FOSTER HOBSON, Lowell, Mass., (b. 1885). Graduate of Lowell High School, 1902, and of Mass. Inst. of Tech., 1906. Worked six months in 1906 on the alignment force of the P. N. Y. & L. I. R. R. Co., East River Tunnels, Long Island City, and in 1907 changed to inspection staff, and was inspector of caisson No. 1, Long Island City, for three months; in 1907 was surveying for the Rocky Mt. Cattle Co., Wyoming, also built an earthen dam for the same company. At present he is an assistant in City Engineer's office, Lowell, Mass. Recommended by George Bowers, G. A. Nelson, Arthur Bartlett and A. T. Safford.

SEAGRAVE, ARNOLD, Woonsocket, R. I., (b. 1876). Attended public schools of Woonsocket and graduated from its high school in 1894. Began work with Willard Kent, C. E., in April, 1895, who, in addition to a general engineering practice, was engineer for Ray System of Electric Railways and for Woonsocket Electric Machine and Power Co. While in Mr. Kent's employ he filled every position, and was in charge of his Woonsocket office from October, 1901, to March, 1906; at the latter date he opened an office and formed a partnership under firm name of Seagrave & Lincoln for the general practice of civil engineering. Recommended by J. W. Ellis, F. A. Caldwell, F. H. Mills and Willard Kent,

ARTHUR E. TARBELL, Somerville, Mass., (b. 1883). Graduated from the Mechanic Arts High School, Springfield, Mass., in 1903, and has since been taking a course with the American School of Correspondence. Began work as rodman, Sept., 1903, for the Metropolitan Park Commission, and worked as rodman and instrument man for two and a half years; in March, 1906, was transferred to the Charles River Basin Commission, was instrument man for eight months and in charge of party for sixteen months, which position he now holds. Recommended by J. N. Ferguson, C. F. Morse, D. A. Ambrose and J. A. Holmes.

ERNEST MILTON TREFETHEN, Lynn, Mass., (b. 1881). Educated in the public schools of Lynn, including three years in the Lynn Manual Training School. Entered City Engineer's Office, Lynn, in 1902 as rodman, later transit man and head of party, in charge of street work in 1905 and now assistant in charge of street work in office of City Engineer, Lynn, Mass. Recommended by G. I. Leland, C. W. Gay, B. E. Ames and C. B. Breed.

JOSEPH FREMONT WILBER, Somerville, Mass., (b. 1884). Graduated from the Somerville English High School in 1902. From June, 1902, to May, 1903, with the General Electric Co. and C. S. Gooding; and since May, 1903, with Hollis French and Allen Hubbard, consulting engineers, as draftsman on various hydro-electric and steam turbine plants. At present is assistant to chief engineer in charge of power station designs. Recommended by G. G. Shedd, E. B. Richardson, J. S. Rankin and H. K. Barrows.



## RECOMMENDATION FOR HONORARY MEMBERSHIP.

Under authority of By-law 7, the entire Board of Government recommends for honorary membership in the Society: —

ERASMUS DARWIN LEAVITT of Cambridge, Mass. He was born at Lowell, Mass., Oct. 27, 1836. He served three years apprenticeship in machine shop, 1852 to 1855; worked one year under instruction for Corliss & Nightingale, 1855 to 1856; took out first patent in 1855 and was engaged in exploiting it in 1856 and 1857 at Lowell; was assistant foreman for Harrison Loring 1858, and had charge of building the engines of U. S. S. Hartford: in 1859 built first engine with gridiron slide valves, worked by sliding bar cams: from 1859 to 1861 was chief draftsman for Thurston, Gardner & Co. of Providence, R. I., and was witness in the Corliss-Sickels and Corliss-Greene suits; entered the U. S. Navy in 1861, being for a time instructor in steam engineering at the Naval Academy at Annapolis, and resigned in 1867 to resume professional practice; invented Lynn type of pumping engine in 1871, one of which was built for the Lynn Water Works and two for the Lawrence Water Works; invented the Calumet and Hecla inverted type of engine in 1874, some of which were used for pumping and some for hoisting and power work; was appointed consulting engineer for the Calumet and Hecla Mining Co. in 1878, and before and since that time designed and supervised construction of many power plants for them; and has been consulting engineer for various cities and companies over periods of many years. He was president of the American Society of Mechanical Engineers 1882-1883, and was one of the commissioners for the new Cambridge and Boston Bridge. In 1884 the Stevens Institute of Technology conferred upon him the honorary degree of Doctor of Engineering. He was elected a member of this Society Jan. 21, 1880.

## MEETINGS OF THE NORTHEASTERN SECTION OF THE AMERICAN CHEMICAL SOCIETY.

### ANNOUNCEMENT.

The eighty-fourth meeting of the Northeastern Section of the American Chemical Society will be held at the Tech Union on Garrison Street, Boston, at 8 p. m. Friday, April 24th.

Prof. W. H. Walker of the Massachusetts Institute of Technology will present a paper upon "The Corrosion of Iron and Steel" with illustrations.

Professor Walker has just been awarded the Wm. H. Nichols Medal of the Society for his researches on this subject.

To reach the Tech Union, take Huntington Avenue Cars to Garrison Street and walk through Garrison Street two squares to the end of the street.

Visitors are always welcome at the meeting.

# MINUTES OF MEETINGS.

## ANNUAL MEETING OF THE SOCIETY.

BOSTON, MARCH 18, 1908. — The annual meeting of the Boston Society of Civil Engineers was held at Chipman Hall, Tremont Temple, at 7.30 o'clock P.M., President Edward W. Howe in the chair, 81 members and visitors present.

The record of the last meeting was read and approved.

Mr. Joseph P. Davis, a past President of the Society, was elected an honorary member, and Messrs. William W. Churchill, Harold P. Farrington, Howard G. Harrison, John F. Peterson and Charles S. Tinkham were elected members of the Society.

The Secretary read the annual report of the Board of Government and, on motion, it was accepted and placed on file.

The Secretary then read his annual report and, on motion, it was also accepted and placed on file.

The Treasurer read his annual report and, on motion, it was accepted and placed on file.

Mr. Street presented and read the annual report of the Committee on Excursions. On motion, the report was accepted and placed on file.

The Librarian read the annual report of the Committee on the Library and, on motion, it was accepted and placed on file.

Mr. Johnson presented and read the annual report of the Committee on Advertisements. On motion, it was accepted and placed on file.

The Secretary read a short note from Mr. FitzGerald, Chairman of the Committee on Quarters, stating that the committee had held no meetings during the year, and that "the quarters now at Tremont Temple, while, perhaps, hardly as satisfactory as we might wish, do not seem to call for an immediate change." On motion, the report was accepted.

The Secretary read the following communication, entitled "A plea for a larger membership and a club house" :

*To the Members of the Boston Society of Civil Engineers:*

The writer wishes to bring a matter before the Society that has long been uppermost in his mind. It concerns making the Society more of a social body than he feels that it now is. To make even a suggestion as to any improvement in the running of such an old and well-organized body as the Boston Society of Civil Engineers may seem presumptuous, but the writer hopes that any suggestions or criticisms that follow will be received in the spirit that they are offered.

To begin with, we do not seem to attract a sufficiently large number of engineers to our membership. During the past twelve months we have had only 46 applications for membership, of which number the writer secured 5, and it was only by strenuous recruiting that he induced these 5 to join our ranks. From 1904 to 1907 the Boston Society gained in membership only 7½ per cent., whereas the American Society of Civil Engineers, for example, showed a gain of about 34 per cent. in the same period.

In May, 1907, our Society had 628 members, of whom about 280 were

registered from Boston proper, about 450 from Massachusetts and the rest, about 180, from points outside the state. Our membership in Boston proper, not to mention "Greater Boston," seems to the writer to be too small. Statistics show that there were, in 1907, 125 civil engineering graduates from the Massachusetts Institute of Technology registered from Boston. There are no doubt three times that number here who have spent some time at the Institute. Add to this legion the numerous engineers who followed other branches of the engineering profession at the Institute, the large number of alumni of other technical schools and the great body of able engineers who received no collegiate technical training, and a casual glance, with most modest methods of estimating, will clearly show that we have not one half the resident membership that we ought to have, not only for our own sakes, but for the good of those who have neglected to affiliate with us up to the present time. The same condition of affairs obtains to a greater or less degree throughout the state.

As regards members from outside of Massachusetts, and particularly outside of New England, we can hardly expect to attract many new ones, but we certainly do want to retain the old ones and any present resident members who may move away.

A great many young engineers to whom the writer has suggested membership have declined on the ground that they preferred to join the American Society of Civil Engineers. The main attractions that the American Society possesses for a non-resident member are a supposed prestige and the excellent literature furnished. The effect of these attractions on some of the younger engineers is best shown by the Junior members of the American Society of Civil Engineers registered from Boston in 1907. Of nine such members only one belongs to both societies, whereas of the 100 corporate members of the American Society, 72 are also members of the Boston Society. Can we not attract the younger engineers to our Society before they seek membership in the great national society?

The question naturally arises as to how to increase our membership. At present this depends almost entirely on the individual efforts of the members of the Society, and there is not the slightest doubt that with each resident member acting as a committee of one, at least two hundred desirable new members might be readily obtained during the coming twelve months. This would mean an average of less than one for each member.

The greatest handicap to the social side of our Society seems, to the writer, to be the unsuitable place that we now have for our headquarters and for holding our meetings. To have our meeting place in a temple of Worship, where a certain feeling of restraint antagonistic to good-fellowship is ever present, seems decidedly incongruous. A new and suitable home seems to be the only true solution, and that at an early date.

That the rank and file of our Society are social beings, seeking recreation and good-fellowship as well as technical instruction and entertainment, is clearly evinced by the attendance both at meetings and on excursions where the purely technical part is judiciously tempered with sociability. We have only to refer to the large attendance at such functions to conclusively prove this statement.

The writer has no particular suggestions to make as to the exact method to pursue in arranging for the acquisition of a suitable club house. He hopes, however, that the Society will give the matter even more earnest consideration than heretofore and that the score or more gentlemen, already members for more than a third of a century, whom we are fortunate in now honoring as so-called "original" members, may all be with us when we dedicate the building to be used as a permanent home for the Boston Society of Civil Engineers.

LUZERNE S. COWLES,

*Member Boston Society of Civil Engineers.*

Boston, March 18, 1908.

After a discussion of the subject-matter of the communication, on motion of Mr. Fernald, it was voted: "That a special committee of five

be appointed to investigate and report upon the question of securing new quarters along the lines outlined in the communication of Mr. L. S. Cowles, of March 18, 1908." It was also voted that the incoming President be requested to appoint this committee.

On motion of Mr. Adams, the recommendation of the Board of Government appropriating the sum of \$50 for standard engineering books was adopted.

On motion, duly seconded, it was voted to refer to the Board of Government, with full powers, the continuation and appointment of the several special committees of the Society.

Messrs. Mayo T. Cook and John N. Ferguson, the tellers of election, reported the results of the letter ballot and in accordance with their report the following officers were declared elected:

President — Joseph R. Worcester.  
Vice-President (for two years) — Henry F. Bryant.  
Secretary — S. Everett Tinkham.  
Treasurer — William S. Johnson.  
Librarian — Frederic I. Winslow.  
Director (for two years) — George Bowers.

Mr. William F. Williams then read the paper of the evening entitled, "The Abolition of Grade Crossings in New Bedford." The paper was illustrated by lantern slides.

Adjourned.

S. E. TINKHAM, *Secretary*.

#### TWENTY-SIXTH ANNUAL DINNER.

The twenty-sixth annual dinner of the Boston Society of Civil Engineers was served at the Hotel Vendome, Boston, Tuesday evening, March 10, 1908, and was attended by 161 members and guests. The usual informal reception was held at six o'clock and the dinner was served at seven o'clock.

The special guests of the Society were Mr. Charles Macdonald, President American Society of Civil Engineers; Mr. Fred. J. Miller, Vice-President American Society of Mechanical Engineers; Hon. Walter C. Wardwell, Mayor of Cambridge; President Arthur A. Noyes of the Massachusetts Institute of Technology; Hon. Charles F. Choate, Jr., of Boston; Mr. Frank B. Gilbreth, of New York, and Mr. Sylvester Baxter, Secretary of the Metropolitan District Improvement Commission.

A pleasing innovation at this year's dinner took the form of some original verses contributed by members of the Society and fitted to popular tunes, which were sung, between the courses, by those present, led by a quartet of members.

At the conclusion of the dinner the President of the Society, Mr. Edward W. Howe, introduced successively the several speakers: Mr. Macdonald, who brought the fraternal greetings of the American Society of Civil Engineers; Mr. Miller, who spoke for the Mechanical Engineers and urged the formation of a mechanical section of the Society; Mayor Wardwell, who alluded to the days when he was associated in civil engineering work with some of the members whom he saw present; and Mr. Choate, who spoke for the legal profession.

Mr. Wm. E. McClintock, a past president of the Society, reminded members that at the dinner a year ago the full program could not be carried out owing to the sickness of the perennial committee on dinner,



Mr. Manley, and the gift which had been prepared to present him at that dinner was sent to his house. He felt that the members would be glad to hear now the word from Mr. Manley which was missed last year. Mr. Manley on rising was received by hearty applause and another musical effusion from those present. Mr. Manley expressed his appreciation of the many honors which the Society has conferred upon him, of the confidence which had been placed in him by the call to arrange the annual dinner for these twenty-six years and above all for the beautiful gift which had been sent him a year ago, coming at the time when such a remembrance struck a more responsive chord, if possible, than at any other time. Music was furnished by the Albion Quartet.

#### ANNUAL REPORT OF THE BOARD OF GOVERNMENT FOR THE YEAR 1907-1908.

BOSTON, MASS., March 18, 1908.

##### *To the Members of the Boston Society of Civil Engineers:*

In compliance with the requirements of the constitution, the Board of Government submits its report for the year ending March 18, 1908.

At the last annual meeting the total membership of the Society was 635, of whom 600 were members of the Society, 2 honorary members, 13 associates and 20 were members of the Sanitary Section only.

During the year the Society has lost a total of 21 members: 12 by resignation, 6 by forfeiture for non-payment of dues and 3 have died.

There have been added to the Society during the year a total of 36 members in all grades; 33 by election and 3 by reinstatement.

The present membership of the Society consists of 1 honorary member, 13 associates and 636 members, of whom 18 are members of the Sanitary Section only; making the total membership 650.

Record of deaths during the year is:

Charles H. Haswell, honorary member, died May 12, 1907.

Frank W. Upham, died May 3, 1907.

Alfred E. Nichols, died July 31, 1907.

In the death of Mr. Haswell the Society lost its oldest member, one whose membership dates from June 3, 1850, a record of nearly fifty-seven years.

Ten regular meetings of the Society have been held during the year, and the twenty-sixth annual dinner was given at the Hotel Vendome on March 10, 1908. The average attendance at the regular meetings was 76, the largest being 120 and the smallest 35. The attendance at the annual dinner was 161.

At the regular meetings the following papers have been read:

March 20, 1907. — President Frank W. Hodgdon, "Difficulties Encountered in Early Surveys of the State of Massachusetts; How They were Overcome and the Results Obtained."

April 17, 1907. — Memoir of Nelson Spofford, by committee of the Society. Mr. George B. Francis, "Pennsylvania Terminal Station in New York City and the Engineering Problems Connected Therewith." (Illustrated.)

May 15, 1907. — Memoir of John E. Cheney, by committee of the Society. Mr. Thomas MacKellar, "The Simplex System of Concrete Piling" (Illustrated); Mr. Charles R. Gow, "Concrete Piles" (Illustrated).

June 19, 1907. — An illustrated talk by Mr. Desmond FitzGerald.

September 18, 1907. — Memoirs of Charles H. Haswell and Frank W. Upham, by committees of the Society. Mr. Herman K. Higgins, "Panama from the Human Side." (Illustrated.)

October 16, 1907. — Mr. Edward W. DeKnight, of New York, "Waterproof Engineering." (Illustrated.)

November 20, 1907. — Mr. Stephen Child, "Civic Centers and the Grouping of Public Buildings, with Suggestions for Boston." (Illustrated.)

December 18, 1907. — Mr. W. M. Davis, of Boston, "Economical Lubrication in Large Plants"; Mr. E. G. Bailey, of Boston, "Furnace Design in Relation to Fuel Economy."

January 20, 1908. — Mr. H. A. Carson and Mr. Wm. J. Wilgus, of New York, "Double Track Railroad Tunnel under the Detroit River at Detroit." (Illustrated.)

February 19, 1908. — Mr. Allen Hazen, "A Short Trip in Australia." (Illustrated.)

Four informal meetings have been held in the Society's library during the year.

December 11, 1907. — Discussion "on Methods of Finishing Concrete Surfaces," opened by Prof. L. J. Johnson.

January 8, 1908. — "Difficulties Encountered in the Town Boundary Survey and the Application of Plane Table Work to Portions of the Survey," by Mr. Henry B. Wood.

January 29, 1908. — "Description of a Concrete Steel Parkway Bridge in Cambridge," by Mr. Lewis M. Hastings.

February 12, 1908. — Discussion of papers read at the December meeting on "Lubrication of Large Plants," and on "Furnace Design in Relation to Fuel Economy."

From the Treasurer's report it will be learned that the finances of the Society are in good condition and that there has been a substantial gain in the Permanent Fund and in the unexpended balance of the Current Fund. A change has been made in the investment of about ten thousand dollars of our Permanent Fund. This was made necessary by the maturing of shares in coöperative banks and the near approach to the legal limit of our accounts in some of the savings banks. The reinvestments were made by the Treasurer by direction of the Board and with the advice of a special committee appointed for the purpose.

The lease of our quarters will expire on June 1, next. As the changes made at the time of the last renewal of our lease have afforded sufficient space for the probable growth of the library during the next three years, the Board recommends a renewal of the lease for that time.

The report of the Executive Committee of the Sanitary Section shows that the Section has had a successful year, with the usual number of meetings, which have been well attended and been of considerable interest and profit. Experience thus far shows the wisdom of the establishment of this Section, and it is the opinion of the Board that it would be of great benefit to the Society if sections interested in other special branches could be organized.

The Board endorses the recommendation of the Library Committee that the practice of buying standard engineering books be continued, and that the sum of \$50 be appropriated for that purpose for the coming year.

For the Board of Government,

EDWARD W. HOWE, *President*.

ABSTRACT OF THE TREASURER'S AND THE SECRETARY'S REPORTS FOR THE  
YEAR 1907-1908.

CURRENT FUND.

*Receipts:*

Dues for 1905-1906.....	\$13.00	
Dues for 1906-1907.....	8.00	
Dues for 1907-1908.....	3 992.00	
Dues for 1908-1909.....	101.00	
Rent of rooms.....	1 000.00	
Advertisements.....	595.00	
Library fines.....	3.25	
Permanent Fund, payment of loan.....	63.95	
Balance on hand, March 20, 1907.....	385.69	
	<hr/>	\$6 161.89

*Expenditures:*

Rent.....	\$1 995.00	
Lighting.....	31.03	
Association of Engineering Societies.....	1 272.00	
Printing, postage and stationery.....	986.62	
Salaries of Secretary, Librarian and Custodian ..	550.00	
Reporting meetings.....	128.38	
Stereopticon.....	90.00	
Annual dinner.....	80.60	
Books.....	41.75	
Binding.....	97.25	
Periodicals.....	26.50	
Furniture and repairs.....	28.00	
Advertisements in JOURNAL.....	15.00	
Incidentals.....	229.73	
	<hr/>	5 571.86
Balance on hand, March 18, 1908.....	\$590.03	
Amount to the credit of Current Fund, March 20, 1907 ..	449.64	

Excess of receipts over expenditures..... \$140.39

PERMANENT FUND.

*Receipts:*

Thirty-three entrance fees.....	\$330.00	
Interest on deposits in savings banks.....	270.08	
Interest on bonds .....	126.00	
Interest on deposits in trust company.....	19.26	
Subscription to Building Fund.....	100.00	
Workingmen's Co-operative Bank, 21 matured shares.....	4 228.35	
Volunteer Co-operative Bank, 25 matured shares ..	5 033.75	
Withdrawn from savings banks.....	4 500.00	
	<hr/>	\$14 607.44

*Expenditures:*

Merchants' Co-operative Bank, dues on 25 shares,	\$300.00	
Volunteer Co-operative Bank, dues on 25 shares .	275.00	
Workingmen's Co-operative Bank, dues on 25 shares.....	321.00	
Franklin Savings Bank, deposit.....	34.58	
Warren Institution for Savings, deposit.....	51.72	
Boston Five Cents Savings Bank, deposit.....	51.18	
Provident Institution for Savings, deposit.....	38.87	
Eliot Five Cents Savings Bank, deposit.....	49.08	
Institution for Savings in Roxbury, deposit.....	44.65	
\$4 000 Boston Elevated Railway Bonds.....	4 038.00	
\$3 000 American Tel. & Tel. Co. Bonds.....	2 371.08	
\$3 000 C. B. & Q. Joint Bonds.....	2 553.75	
Twenty-one shares Volunteer Co-operative Bank,	2 895.00	
Current Fund, repayment of loan.....	63.95	
		<hr/>
		13 087.86
		<hr/>
Balance on hand, March 18, 1908.....	\$1 519.58	

PROPERTY BELONGING TO THE PERMANENT FUND, MARCH 18, 1908.

Twenty-five shares Merchants' Co-operative Bank.....	\$3 051.16	
Twenty-five shares Volunteer Co-operative Bank.....	3 099.40	
Twenty-five shares Workingmen's Co-operative Bank.....	516.44	
Deposit in Franklin Savings Bank.....	487.46	
Deposit in Warren Institution for Savings.....	732.21	
Deposit in Boston Five Cents Savings Bank.....	703.65	
Deposit in Provident Institution for Savings.....	688.99	
Deposit in Eliot Five Cents Savings Bank.....	546.18	
Deposit in Institution for Savings in Roxbury.....	509.95	
Republican Valley Railroad Bond, 6% par value.....	600.00	
Boston Elevated Railway Bonds, 4½% par value.....	4 000.00	
C. B. & Q. Railroad Joint Bonds, 4% par value.....	3 000.00	
American Tel. & Tel. Co. Bonds, 4% par value.....	3 000.00	
Cash on deposit.....	1 519.58	
		<hr/>
Total Permanent Fund.....	\$22 455.02	
Amount of fund as per last annual report.....	20 058.27	
		<hr/>
* Gain during the year .....	\$2 396.75	

TOTAL PROPERTY OF THE SOCIETY IN THE POSSESSION OF THE TREASURER.

Permanent Fund.....	\$22 455.02	
Current Fund.....	590.03	
		<hr/>
Total.....	\$23 045.05	
Amount as per last annual report.....	20 507.91	
		<hr/>
* Increase during the year .....	\$2 537.14	

\* Of this gain, \$1 037.17 is the difference between the par value of the bonds purchased and the amount paid for them.



## REPORT OF COMMITTEE ON EXCURSIONS.

BOSTON, March 18, 1908.

*To the Members of the Boston Society of Civil Engineers:*

The Committee on Excursions herewith respectfully submits its annual report.

Ten excursions have been made during the past year, as follows:

May 15, 1907. — Concrete Piles at the Milton Car Barns of the Boston Elevated Railway. Attendance, 28.

August 7, 1907. — Turbine Steamer *Yale*. Attendance, 38.

August 22, 1907. — With United States Army Engineers. Inspection of dredgers and Fort Warren. Attendance, 137.

September 7, 1907. — Excursion to Wonderland Park. Attendance, 80.

September 18, 1907. — Inspection of Hassam Pavement laid by Simpson Brothers, in Cambridge. Attendance, 8.

October 19, 1907. — Blue Hill Observatory. Attendance, 42.

October 29, 1907. — Inspection of concrete buildings built by Benj. Fox for the Boston Woven Hose and Rubber Company, Cambridge. Attendance, 40.

November 15, 1907. — Fore River Ship Building Company. Attendance, 50.

December 18, 1907. — Inspection of concrete buildings of Robb-Mumford Company and Richard H. Long Company, at South Framingham. Attendance, 12.

February 19, 1908. — Inspection of work on the Lawrence and Wiggin Wharf at Charlestown. Attendance, 5.

Total attendance, 440; average attendance, 44.

Thirty-two and one-half pages of the *Bulletin of New Engineering Work* and seven pages of *Personal Notes*, or a total of thirty-nine and one-half pages, have been published during the past year, as against thirty-six pages for the previous year.

There is a cash balance of \$18.90 in the hands of the Treasurer.

The committee wishes to thank all those who have aided in this work and to express its wish that members at all times will be free to send suggestions for excursions and items for the *Bulletin of New Engineering Work* and the column of *Personal Notes*.

Respectfully submitted,

L. LEE STREET, *Chairman*,

EUGENE E. PETTEE,

CLARENCE T. FERNALD,

LAURENCE B. MANLEY,

EDMUND M. BLAKE, *Sec'y and Treas.*

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## REPORT OF THE COMMITTEE ON THE LIBRARY.

The annual report of the Committee on Library is herewith submitted:

During the past year there have been added to the library 200 volumes bound in cloth, making a total of 6,258. Of this number 25 were bought, 43 were bound current magazines and 132 were gifts to the Society.

There were 432 volumes in paper added to the library, mainly consisting of reports and bulletins.

An attempt was made, involving considerable labor, to complete our files of town and city reports, and these have now been completed about as far as is practicable. This work was done by one of the members of the committee, and it involved sending out sixty printed requests to the various towns and cities.

The Librarian has felt obliged to enforce the rules regarding fines for books kept overtime and also to disallow the borrowing of books in constant demand, such as those on reinforced concrete, and handbooks such as Kent, Trautwine, etc.

During the year, 155 books have been borrowed from the library.

The committee recommends that the sum of \$50 be allowed the coming year for the purchase of current engineering publications.

Respectfully submitted,

FREDERIC I. WINSLOW,  
CHARLES SAVILLE,  
HERBERT R. STEARNS,  
NATHAN S. BROCK,

*Committee.*

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#### REPORT OF THE COMMITTEE ON ADVERTISEMENTS.

BOSTON, March 18, 1908.

*To the Boston Society of Civil Engineers:*

The Advertising Committee begs to submit the following report:

At the present time there are 41 advertisements carried in the *Monthly Bulletin*, which yield \$910.00 per year, and three advertisements in the JOURNAL OF THE ASSOCIATION OF ENGINEERING SOCIETIES, netting the Society \$135.00, making a total revenue for advertisements of \$1,045.00 per year.

The amount of advertising carried is somewhat smaller than the amount reported last year. The decrease is due in part to business conditions, but chiefly to the decrease in activity on the part of the Advertising Committee. This lethargy in turn may be explained in part by the fact that with even the present amount of advertising a surplus in the treasury is assured, so that the incentive of last year is now lacking.

It has been suggested by some of the members of the Society that advertising in the *Bulletin* is a species of graft, but it seems to your committee, from the responses which are received from advertisers, that the *Bulletin* is one of the best mediums for certain classes of advertising and, on the other hand, that besides producing a much-needed revenue, the advertising makes the *Bulletin* more attractive.

WILLIAM S. JOHNSON,  
S. E. TINKHAM,  
F. A. BARBOUR,

*Committee.*

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#### ANNUAL REPORT OF THE EXECUTIVE COMMITTEE OF THE SANITARY SECTION.

The Executive Committee of the Sanitary Section makes the following report of the meetings held and attendance during the year 1907-8:

March 6, 1907. Subject: "Wastes from Lowell Gas Light Company's Yard," by Arthur T. Safford. Attendance, 31.

May 1, 1907. Subject: "Run-off from Sewered Areas; Methods Adopted for Securing Data and Results Accomplished." General discussion. Attendance, 38.

June 5, 1907. "Excursion to Sewage Disposal Works and Water Purification Plant at Providence, R. I." Attendance, 38.

November 15, 1907. Subject: "Purification of Boston Sewage; Experimental Results and Practical Possibilities." By Professors C.-E. A. Winslow and E. B. Phelps. Attendance, 61.

December 4, 1907. Subject: "Pollution of Waters at Common Law and Under Statutes." By Charles F. Choate, Jr., Esq. Attendance, 45.

The present number of members of the Section who are also members of the Society is 156; there are 3 associates who are also associates of the main society and 20 who are members of the Sanitary Section only, a total of 179.

The Section through a special committee has already collected sewerage statistics from cities and towns under a uniform method of reporting formulated by the committee, and this work is being continued by the Clerk. The results will be ready for publication within a short time.

The Section through another committee appointed for the purpose is now at work upon the run-off from sewered areas and this committee has already made and published a preliminary report. The Section is very fortunate in having members with enthusiasm enough to devote their time to this work and they should not be allowed to do all the work themselves. All members of the Section to whom a personal appeal for assistance in this work has been made should respond, not only on account of its value to the engineering world at large, but because of the personal interest aroused in experimental work of a very high character.

There are a number of other lines of work, such as "uniform specifications for sewer pipe," which should be given to committees. In order to make the work of this Section valuable and keep up the interest, something should be done each year in the way of original research, for which the time and money should be provided. The committee hopes to see a fund made available for such work, by which these matters can be given the personal attention of some one, a member of the Section, who can be paid for his services.

The committee desires again to call to the attention of the Section the fact that there are not many members of the Section outside of those who are also members of the Boston Society. The Section was organized principally to bring together the engineers and the men who are connected officially with the care and management of sewerage works. It is, therefore, the duty of every one to bring to the attention of such officials, and others interested, the work of the Section and the possibilities of greater activity through an increase in the membership. We must make this a personal duty and increase the number of Section members just as far as possible.

In this connection the Section finds it difficult to get papers from men in actual charge of sanitary work and maintenance, and it is a matter of regret that this should be so. We would urge upon the members the fact that in order to make the work of the Section well balanced, we should be

able to obtain papers and discussions from those members who are fortunate enough to know the practical difficulties in the way of getting good results.

Respectfully submitted,

ARTHUR T. SAFFORD, *Chairman.*

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#### REPORT OF COMMITTEE ON RUN-OFF.

BOSTON, MASS., MARCH 4, 1908. — The Committee on Run-off from Sewered Areas submits the following report of its work during the year 1907:

The work of your committee has been confined almost entirely to investigations, plans and correspondence looking to the establishment of stations for making observations. There have been held five meetings of the committee, which were well attended, and numerous meetings of sub-committees. The committee now has nine stations assured from which observations will be made during 1908, and expects to largely increase this number in the near future.

Early in the year the committee found that it must be prepared to recommend apparatus, give an estimate of the cost and advise as to the installation as well as to the method of collecting and recording the data; and for the purpose of presenting the conclusions of the committee and the information which had been collected to members of the profession who would help in the work by establishing observation stations, submitted a preliminary report on these matters, an important feature of which was the collecting and listing of such papers covering the subject as had already been printed. Printed copies of this report have been widely distributed, and other copies will be furnished upon application.

The committee has received many favorable commendations as to the desirability and value of this work, but has found that many whose co-operation is needed hesitate to install and operate the needed apparatus. This is partly on account of the expense, but probably largely due to the fact that the necessity of collecting this information is not generally understood among members of city governments, and the engineer hesitates to introduce a proposition which will not be appreciated and which may cause criticisms. The committee believes that, in presenting the proposition, it should be represented that the information to be obtained will be of service in answering claims which may be brought against the municipality on account of insufficient drainage or because of overflow from drains already built; that the observations and collated results will be of great value in determining the sizes of storm water drains with more exactness than is now possible and should result in increased ultimate economy in the construction of drainage systems.

This is a work which must necessarily extend over a long period of time, for after a sufficient number of stations have been established, the period of observations must cover at least two years in order to study the results of varying intensities of rainfall. Your committee expects to furnish to each observer compilations of the data as it is collected, together with the conclusions derived from the same. The committee reiterates the statement made in the preliminary report that "while the Sanitary Section, through its committee, has taken the initiative in starting this investigation, the function of the committee will be merely that of a clearing house.



The value of the results must depend upon the number and interest of those who coöperate." Such coöperation by every member of the Section is earnestly solicited.

Respectfully submitted,

LEWIS M. HASTINGS,  
IRVING T. FARNHAM,  
GEO. A. CARPENTER, . .  
HECTOR J. HUGHES,  
HARRISON P. EDDY, *Committee.*

## SOCIETY OF ARTS MEETINGS.

Through the courtesy of the Secretary of the Society of Arts announcement is made of the following meetings of that Society : —

April 23, 1908, Prof. Dugald C. Jackson will speak.

May 14, 1908, Prof. Geo. F. Swain will talk on the Quebec Bridge Disaster.

### LIST OF MEMBERS.

#### ADDITIONS.

WILLIAM H. BALCH	. . . . .	43 Maple St., Stoneham, Mass.
JOHN BALCH BLOOD	. . . . .	10 Post Office Sq., Boston.
A. MARSHALL DOANE	. . . . .	South Weymouth, Mass.
HAROLD P. FARRINGTON	. . . . .	56 Bellevue St., West Roxbury, Mass.
HOWARD G. HARRISON	. . . . .	City Hall, West Newton, Mass.
THOMAS G. HAZARD, JR.	. . . . .	Narragansett Pier, R. I.
JOHN F. PETERSON	. . . . .	223 Brattle St., Cambridge, Mass.
CHARLES S. TINKHAM	. . . . .	126 Thornton St., Roxbury, Mass.
ARTHUR D. WESTON	. . . . .	12 Rosewood St., Mattapan, Mass.
WALTER T. WILEY	. . . . .	26 Westcott St., Dorchester, Mass.
DANA M. WOOD	. . . . .	35 Myrtle St., Belmont, Mass.

#### RESIGNATIONS.

ERNEST W. BOWDITCH	. . . . .	March 18, 1908.
FRED V. FULLER	. . . . .	March 18, 1908.
HERBERT E. GAGE	. . . . .	March 18, 1908.
HORACE G. HOLDEN	. . . . .	March 18, 1908.
W. DABNEY HUNTER	. . . . .	March 18, 1908.
HERBERT S. KIMBALL	. . . . .	March 18, 1908.
DANA LIBBEY	. . . . .	March 18, 1908.
EDWARD B. STEARNS	. . . . .	March 18, 1908.
RALPH H. STEARNS	. . . . .	March 18, 1908.
RICHARD H. TINGLEY	. . . . .	March 18, 1908.
CLAUDE A. PALMER (Associate)	. . . . .	March 18, 1908.
CHARLES HARRINGTON (Sanitary Section)	. . . . .	March 18, 1908.
DOUGLAS C. MORIARTA (Sanitary Section)	. . . . .	March 18, 1908.

## LIBRARY NOTES.

### RECENT ADDITIONS TO THE LIBRARY.

Walls, Bins and Elevators, by M. S. Ketchum.  
 Cements, Limes and Plasters, by Eckel.  
 Holiday Studies of Cities and Ports, by Peabody.  
 Contraction of the Liquid Vein, by Bazin and Trauterine.  
 San Francisco Earthquake, by Hummelwright.  
 Index of Engineering Literature, Annual for 1907.

United States Government Water Supply and Irrigation Papers, 17 numbers.

United States Government Statistics of Railways, 1907.

United States Government Coast and Geodetic Survey Report, 1907.

American Society Mechanical Engineers' Year Book, 1908.

American Society Civil Engineers List of Members, 1908.

Massachusetts Harbor and Land Commissioners, Annual Report, 1907.

New York State Engineer and Surveyor, Annual Report, 1906, 2 volumes.

Andover, Mass., Annual Report Board of Public Works, 1907.

Attleboro, Mass., Annual Report Water Department, 1907.

Brookline, Mass., Annual Report Water Board, 1907.

Chicago, Ill., Quarterly Statistics Report, February, 1908.

Leominster, Mass., Annual Report Water Board, 1907.

North Adams, Mass., Annual Town Report, 1907.

Plymouth, Mass., Annual Report Water Commissioners, 1907.

Rutland, Vt., Annual City Report, 1907.

St. Paul, Minn., Annual Report Water Commissioners, 1907.

Taunton, Mass., Annual Report Water Department, 1907.

Waltham, Mass., Annual Report Water Department, 1907.

Woonsocket, R. I., Annual Report Water Commissioners, 1907.

A number of the town and city reports are at the binders.

FREDERIC I. WINSLOW, *Librarian.*

## NEW ENGINEERING WORK.

Under this head the Excursion Committee proposes to present each month a brief résumé of engineering work in progress in New England, as far as such information is readily obtainable. The assistance of members is desired, and items of interest will be gladly received. Such items are intended to include not only works of exceptional magnitude or containing novel features, but also engineering construction work of all kinds and all degrees of magnitude. Notes should be in the hands of the Committee not later than the 2nd Wednesday of each month. The thanks of the Committee are due to the members who have furnished data for the Bulletin.—E. M. BLAKE, Secretary, Excursion Committee, 8 Beacon St., Boston.)

**United States Government.**—Specifications have been issued and bids invited, to be opened April 17, 1908, for the construction of a portion of the superstructure of the breakwater at Sandy Bay, Cape Ann, to the extent of the funds available, viz., \$200,000.

Specifications have been issued and bids invited, to be opened April 30, 1908, for the dredging necessary to complete the improvement of Dorchester Bay and Neponset River for a channel 18 feet deep to Commercial Point and 15 feet deep thence through the railroad bridge to the highway bridge at Neponset. The amount available is \$125,000.

A contract has been entered into for the construction of the shaft of the Pilgrim Memorial Monument at Provincetown, the work to be completed by the end of 1909.

Surveys are in progress for the purpose of determining the advisability of making improvements at the following localities:—

Of the Merrimac River for a 14-foot channel to Haverhill, by the construction of lock and dam.

Gloucester Harbor for the removal of ledges.

Plymouth Harbor for the construction of a breakwater on Brown's Island for the protection of the anchorage near Duxbury Pier Light.

Mystic River, with a view to deepening the channel to 30 feet to Island End River.

**Commonwealth of Massachusetts.**—METROPOLITAN PARK COMMISSION.—The following is a list of the work now in progress and contemplated under the direction of this department:—

*Mystic River Reservation.*—The work of completion of concrete bridge for the Boston & Maine Railroad, Southern Division, over the drive, is in progress.

It is expected soon to resume the work of constructing boat lock, dam, sluices, weirs and tide gates at Cradock Bridge, Main Street, Medford.

Plans and specifications have been prepared for a reinforced concrete bridge for the river drive over Alewife Brook, Medford, and it is expected to commence the work shortly.

*Quincy Shore Reservation and Lynn Fells Parkway.*—The work of surfacing and finishing, which was incomplete last fall, has been resumed.

*Middlesex Fells Parkway.*—The work of constructing extension from present end of Fellsway West and roadbed for electric railway into Middlesex Fells Reservation is in progress. The work under this contract, having included considerable rock excavation, has been prosecuted throughout the winter.

**HARBOR AND LAND COMMISSION.**—The work at present in progress is the dredging of the Reserved Channel at South Boston Flats, making the channel 300 feet wide and 20 feet deep at mean



low water, the entrance channel being the same depth and 200 feet wide; also the dredging of sections 1 and 2 of the Anchorage Basin on Bird Island Flats, which, upon completion, will give an anchorage basin 30 feet deep at mean low water, one mile long and 1,000 feet wide. Sections 3 and 4 have just been completed, with the exception of the removal of the shoals left by the main dredging.

The dredging of the westerly end of Bird Island Shoal to the depth of 12 feet at mean low water has just been completed, and a survey is now being made to determine whether any shoal spots have been left.

A contract has just been let for dredging a channel 35 feet deep at mean low water, from the channel dredged by the United States Government to the mouth of the dock on the easterly side of the Cunard Pier at the Grand Junction Wharves, East Boston. This section was dredged by the Commonwealth to the depth of 27 feet at mean low water about ten years ago, but, owing to the increased draught of steamers, it is now necessary to re-dredge it to a greater depth.

In a few days work will commence on the widening of the entrance to West Bay Cut at Osterville on the south shore of the town of Barnstable, making the channel 200 feet wide instead of 100 feet, as originally constructed. The depth is to be 6 feet at mean low water. A stone jetty is to built on the westerly side of the channel to replace the timber jetty, which is to be removed.

The work of dredging the channel at Menemsha harbor, between the towns of Gay Head and Chilmark on Martha's Vineyard, has been re-commenced. This includes also the strengthening of the stone jetties at the entrance. Work is also under way on the extending and enlarging of the stone jetties at Cuttyhunk.

Plans and specifications are now ready, and bids will be received on April 17 and 24 for building concrete sea-walls at North Scituate and an earthen dike with timber core-wall and sluiceways at Herring River, Wellfleet.

Work has just been commenced on the construction of a boat harbor at Deacon's Pond, Falmouth; this involves the construction of 2 stone jetties and the excavation of a portion of Deacon's Pond to form the harbor.

It is expected that work will be commenced sometime during this month on dredging an area in Nantucket harbor for the anchorage of yachts and also the dredging of Rock Creek on the line between Eastham and Orleans to improve the harbor.

**CHARLES RIVER BASIN COMMISSION.**—The special machinery for operating the lower gate at the lock is nearly installed, and work on the upper gate is progressing satisfactorily.

The installation of the operating machinery for the lock filling gates is nearly completed.

Water has been allowed to enter the coffer dam at the lock, and is kept out of the lock by means of special stop planks. The total width of the opening, 25 feet, is divided into three equal spans by temporary vertical steel girders. These girders are supported at the bottom by recesses in the masonry, and at the top by steel trusses. The bottom of the planking is formed of steel "I" beams with 8 inches by 8 inches yellow pine on each side, bolted to the web of the beam. The leakage through these stop planks is easily taken care of by a 2 inch centrifugal pump.

The work of testing the lock gates for water tightness has been started.

The embankment work is progressing well. At the outlet of the Fenway there is a large section of embankment and marginal conduit in progress of construction, including the sub-structure for the Fens gate house. All of the work in this locality is now under contract, and the coffer dams for the gate chamber, the marginal conduit and the Fens Pond Bridge are being constructed. This bridge will be of re-enforced concrete, having one arch span of 23 feet and 2 flat arch spans of 11 feet, one on either side.

**HIGHWAY COMMISSION.**—State highway work is being done in the following cities and towns:

Belchertown,  
Charlton,  
Palmer,  
Southboro.

Southbridge,  
Taunton,  
Webster.

**Boston Transit Commission.**—It is expected that the Washington-Street Tunnel work which will be in progress about April 15, 1908, will consist mainly of interior finish, such as putting tiles on the walls, making balustrades, etc.

**METROPOLITAN WATER AND SEWERAGE BOARD WATER WORKS.**  
—*Sewerage Works.*—Work of construction in the extension of the main trunk sewer, South Metropolitan System, is in progress through West Roxbury, Brookline and Brighton, covering a length of about five miles. Part of this work is in deep tunnel, being carried forward by pneumatic processes, part in rock tunnel and part in open trench. The sewer varies from seven feet in diameter to five feet in diameter.

**Boston Elevated Railway.**—ELEVATED AND SUBWAY CONSTRUCTION.—*Forest Hills Extension.*—Work is in progress on the balance of the foundations for the Forest Hills Extension, with the numerous changes in sewers and pipes incident thereto.

*Roxbury Division.*—Steel work for third track over Washington Street between Dudley Street and Hawthorne Avenue is now erected complete. Replacing a deck with a through span on the Dudley Street Elevated Loop is scheduled for Saturday night, April 11.

*East Cambridge Extension, Charles River Bridge.*—Piers for the new Charles River Building are under construction, one on the East Cambridge side is about one-half completed, and the others are in various stages of construction, from dredging to placing concrete.

*North Approach to Washington-Street Tunnel.*—Foundations for the steel and masonry incline are under construction, and changes to Traverse Street foot passage are in progress.

**Boston & Albany Railroad.**—Bids are being received for the construction of about 11 miles of third track between Chatham and Albany. Construction of some 6 miles of third track is now in progress.

**Springfield.**—It is reported that \$40,000 is to be expended for sewer construction work by day labor.

**Holyoke.**—It is reported that the plans and specifications for the construction of 2,400 feet of 20 inch cast-iron sewer have been completed, to run from the Walnut-Street storm sewer to the main sewer on Front Street, at an estimated cost of \$12,000.

**Fitchburg.**—It is reported that the Nashua River Reservoir Company will expend about \$35,000 during the coming summer in improvements, including the construction of an earthen dam, concrete valve tower and 3 dikes.

**Pittsfield.**—The Ambursen Hydraulic Construction Company of Boston has been awarded the contract for \$35,000 for the construction of a second reservoir dam 30 feet high and 275 feet long on gravel foundations.

**Greenfield.**—It is reported that a committee has been appointed to investigate the question of a filtration plant to prevent pollution of the Green River by sewage.

**Lawrence.**—Plans have been completed and are now before the State Board of Health for covering a section of the old filter bed at a probable cost of \$65,000.

**Pepperell.**—At a special town meeting the Act passed by the Legislature was accepted, and it was voted to issue \$120,000 in bonds to cover the construction of a water supply system.

**Lowell.**—The Vesper Country Club of Lowell, Mass., will build a suspension foot bridge 550 feet long and 5 feet wide across the Merrimack River from the Tyngsboro shore to Tyngs Island. The bridge was designed and will be built by the Westinghouse, Church, Kerr & Company of New York, with Mr. J. R. Worcester of Boston, as consulting engineer. Work will be begun on the abutments this spring as soon as the frost gets out of the ground. Messrs. Arthur T. Safford, chairman, and George A. Nelson are members of the committee who will have charge of building the bridge for the Club.

**City of Boston.**—ENGINEERING DEPARTMENT.—Bids were received on April 2nd for rebuilding Boylston-Street Bridge over the Boston and Albany Railroad; the contract was awarded to the lowest bidder, the Boston Bridge Works, Inc., for \$52,187. In the structure as rebuilt the trusses will be raised wholly above the flooring, and the floor beams provided by the city will be encased in concrete as a protection against locomotive fumes. Of the material in the old city bridge, built in 1888, only the top chords, sway bracing, and a few other truss members, will be retained. The necessary modifications will be made in the structure built last fall by the Boston Elevated Railway Company.



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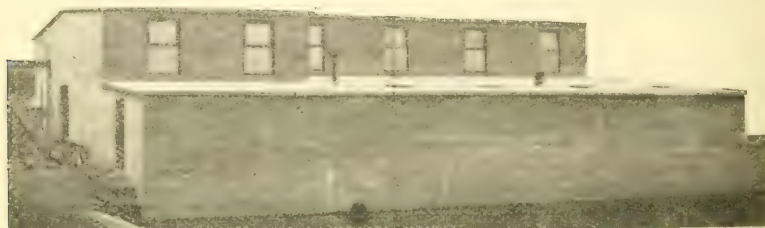
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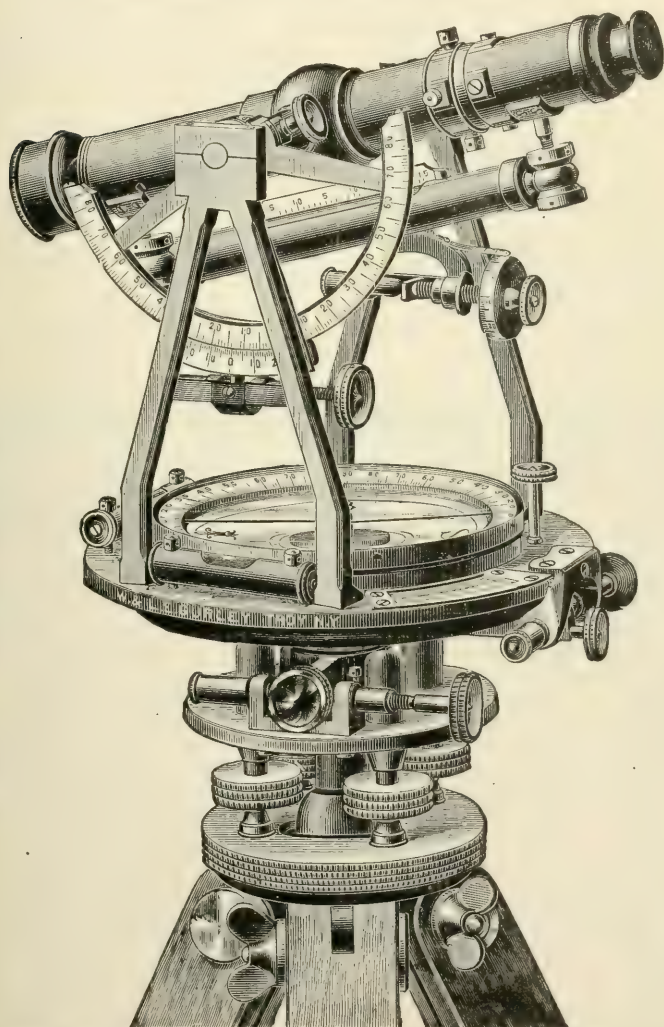
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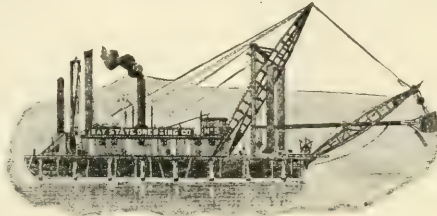
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# MONTHLY BULLETIN.

NEW SERIES.

MAY, 1908.

No. 22.

## REGULAR MEETING.

A regular meeting of the Boston Society of Civil Engineers will be held on Wednesday, May 20, 1908, at 7.30 P. M., in

CHIPMAN HALL, TREMONT TEMPLE, BOSTON.

The meeting will be called to order *promptly* at the hour named.

Mr. James E. Howard, C. E., in charge of the Testing Department at the Watertown Arsenal, will read a paper entitled "Some causes which tend towards the fracture of Steel Rails." The paper will be illustrated by lantern slides.

BUSINESS OF THE MEETING: To ballot on the applications for membership as announced in this notice.

S. E. TINKHAM, *Secretary*.

## EXCURSION.

There will be an excursion on Wednesday, May 20, 1908, through the Washington-Street Tunnel, which is now nearing completion. Members will meet at the ticket office lobby of the Union-Friend Station, 28 Washington Street, about half way between Hanover Street and Haymarket Square, at 1.30 P. M. Arrangements will be made to conduct members in groups through the tunnel, emerging at the incline on Ash Street near Nassau Street. For those who do not wish to make the entire trip, a chance for getting out will be afforded at any of the tunnel entrances or exits.

The excursion will be in charge of Mr. L. B. Manley.

EXCURSION COMMITTEE.



## SIXTIETH ANNIVERSARY.

The Sixtieth Anniversary of the organization of this Society will occur on July 3, 1908, and, following a suggestion of our President, the Excursion Committee are making investigations for a special trip to celebrate the event. They have in mind at present a trip to the White Mountains, the party to start Friday, July 3d, and return Monday or Tuesday, July 6th or 7th.

The Committee are also making investigation as to a trip to Lake Winnepesaukee, and will be very glad to hear from any of the members with regard to this celebration.

E. E. PETTEE, *Chairman*,

79 Milk Street, Boston.

## CANDIDATES FOR MEMBERSHIP.

To be balloted on at meeting, May 20, 1908.

## AS HONORARY MEMBER.

ERASMUS DARWIN LEAVITT of Cambridge, Mass. He was born at Lowell, Mass., Oct. 27, 1836. He served three years apprenticeship in machine shop, 1852 to 1855; worked one year under instruction for Corliss & Nightingale, 1855 to 1856; took out first patent in 1855 and was engaged in exploiting it in 1856 and 1857 at Lowell; was assistant foreman for Harrison Loring 1858, and had charge of building the engines of U. S. S. Hartford: in 1859 built first engine with gridiron slide valves, worked by sliding bar cams: from 1859 to 1861 was chief draftsman for Thurston, Gardner & Co. of Providence, R. I., and was witness in the Corliss-Sickels and Corliss-Greene suits; entered the U. S. Navy in 1861, being for a time instructor in steam engineering at the Naval Academy at Annapolis, and resigned in 1867 to resume professional practice; invented Lynn type of pumping engine in 1871, one of which was built for the Lynn Water Works and two for the Lawrence Water Works; invented the Calumet and Hecla inverted type of engine in 1874, some of which were used for pumping and some for hoisting and power work; was appointed consulting engineer for the Calumet and Hecla Mining Co. in 1878, and before and since that time designed and supervised construction of many power plants for them; and has been consulting engineer for various cities and companies over periods of many years. He was president of the American Society of Mechanical Engineers 1882-1883, and was one of the commissioners for the new Cambridge and Boston Bridge. In 1884 the Stevens Institute of Technology conferred upon him the honorary degree of Doctor of Engineering. He was elected a member of this Society Jan. 21, 1880.

## AS MEMBERS.

CHARLES FREDERICK BREITZKE, NEWTON, Mass., (b. 1881). Graduate in sanitary engineering course, Massachusetts Institute of Technology, in 1906. From June to Sept., 1906, was employed as temporary assistant engineer on New York Board of Water Supply; from Sept., 1906, to Jan., 1907, was in employ of John M. Farley, C. E., and in charge of reservoir construction at Mt. Kisco, N. Y.; from Jan. to April, 1907, was in employ of Hazen & Whipple as assistant on experimental work on aeration of water and sewage; in April, 1907, was appointed bacteriologist at Jerome Park Experiment Station under W. B. Fuller; in Sept., 1907, became Mr. Fuller's private assistant and was employed on work of the Passaic Valley Sewerage Commission; in Oct., 1907, was transferred to office of Hering & Fuller on same work; and Dec., 1907, was made assistant engineer with New York State Department of Health. Recommended by Theodore Horton, W. B. Fuller, Rudolph Hering and Charles Saville.

MAURICE FRITCHLEY BROWN, Winchester, Mass., (b. 1873). With Boston Bridge Works, June, 1889, to September, 1892, as office boy and draftsman; to June, 1894, student at Dartmouth College; to November, 1895, draftsman, Boston Bridge Works; to May, 1898, student Dartmouth College (B. S. 1897) and Thayer School of Civil Engineering (C. E. 1898), during this period working summers with the Boston Bridge Works. Since May, 1898, with the Boston Bridge Works as follows:—to January, 1900, as draftsman and assistant in estimating department; to May, 1900, in charge of estimating and designing; and from May, 1900, to date as chief engineer in general charge of all engineering and directly in charge of estimates and designs. Recommended by J. R. Worcester, E. E. Pettee, G. H. Brazer and F. H. Fay.

HOWARD LINCOLN COBURN, Boston, (b. 1867). Entered Mass. Inst. of Tech. 1883, leaving in 1885 to go to work. Until 1896 draftsman and assistant mechanical engineer with the late Charles Carr of Boston. Re-entered Mass. Inst. of Tech. in 1896 and was graduated in 1898. From 1898 to 1904, various engineering works, including power plant design; since 1904, chief engineer with Ambursen Hydraulic Construction Co. of Boston, in charge of all designs of reinforced concrete dams and power houses, etc. Recommended by R. S. Weston, R. A. Hale, H. F. Bryant and H. K. Barrows.

ARTHUR WALLACE EMERSON, Boston, (b. 1878). Educated in public schools of Milford, N. H. From 1900 to 1902 with Boston Bridge Works as draftsman; from 1902 to 1904 with Purdy and Henderson as draftsman; and from 1904 to date with J. R. Worcester & Co., drawing and designing steel and concrete structures and inspection of all classes of steel work. Recommended by G. H. Brazer, E. E. Pettee, J. R. Worcester and J. C. Moses.

GEORGE FOSTER HOBSON, Lowell, Mass., (b. 1885). Graduate of Lowell High School, 1902, and of Mass. Inst. of Tech., 1906. Worked six months in 1906 on the alignment force of the P. N. Y. & L. I. R. R. Co., East River Tunnels, Long Island City, and in 1907 changed to inspection staff, and was inspector of caisson No. 1, Long Island City, for three months; in 1907 was surveying for the Rocky Mt. Cattle Co., Wyoming,

also built an earthen dam for the same company. At present he is an assistant in City Engineer's office, Lowell, Mass. Recommended by George Bowers, G. A. Nelson, Arthur Bartlett and A. T. Safford.

ARNOLD SEAGRAVE, Woonsocket, R. I., (b. 1876). Attended public schools of Woonsocket and graduated from its high school in 1894. Began work with Willard Kent, C. E., in April, 1895, who, in addition to a general engineering practice, was engineer for Ray System of Electric Railways and for Woonsocket Electric Machine and Power Co. While in Mr. Kent's employ he filled every position, and was in charge of his Woonsocket office from October, 1901, to March, 1906; at the latter date he opened an office and formed a partnership under firm name of Seagrave & Lincoln for the general practice of civil engineering. Recommended by J. W. Ellis, F. A. Caldwell, F. H. Mills and Willard Kent.

ARTHUR E. TARBELL, Somerville, Mass., (b. 1883). Graduated from the Mechanic Arts High School, Springfield, Mass., in 1903, and has since been taking a course with the American School of Correspondence. Began work as rodman, Sept., 1903, for the Metropolitan Park Commission, and worked as rodman and instrument man for two and a half years; in March, 1906, was transferred to the Charles River Basin Commission, was instrument man for eight months and in charge of party for sixteen months, which position he now holds. Recommended by J. N. Ferguson, C. F. Morse, D. A. Ambrose and J. A. Holmes.

ERNEST MILTON TREFETHEN, Lynn, Mass., (b. 1881). Educated in the public schools of Lynn, including three years in the Lynn Manual Training School. Entered City Engineer's Office, Lynn, in 1902 as rodman, later transit man and head of party, in charge of street work in 1905 and now assistant in charge of street work in office of City Engineer, Lynn, Mass. Recommended by G. I. Leland, C. W. Gay, B. E. Ames and C. B. Breed.

JOSEPH FREMONT WILBER, Somerville, Mass., (b. 1884). Graduated from the Somerville English High School in 1902. From June, 1902, to May, 1903, with the General Electric Co. and C. S. Gooding; and since May, 1903, with Hollis French and Allen Hubbard, consulting engineers, as draftsman on various hydro-electric and steam turbine plants. At present is assistant to chief engineer in charge of power station designs. Recommended by G. G. Shedd, E. B. Richardson, J. S. Rankin and H. K. Barrows.

## APPLICATIONS FOR MEMBERSHIP.

The following applications for membership have been received and are now before the Board of Government for approval. Members having information which will assist the government in its consideration of these applications are requested to communicate at once with any member of the Board. Communications will be regarded as confidential and for the use of the Board alone.

## AS MEMBERS.

ARMAND WILLIAM BENOIT, Lawrence, Mass., (b. 1883). Graduated from Tufts College in 1907 with degree of B.S. in civil engineering. Summer of 1905 was assistant engineer at the plant of the United Shoe Machinery Co., Beverly; summer of 1906 was assistant engineer under Ransome & Smith of New York on extension of same plant; and summer of 1907 had charge of some concrete construction in Lawrence; at present with William Wheeler, C. E., Boston. Recommended by R. S. Weston, William Wheeler, C. W. Sherman and Leonard Metcalf.

HARALD DONALD JONES, Boston, (b. 1883). Civil engineering course at Cornell University, 1902-03. Time keeper, Portland Co., 1904; with Megquier & Jones Co., 1905; with New Jersey Bridge Co. 1906; and drafting and estimating for W. F. Kearns Co., 1907, and at the present time. Recommended by G. H. Brazer, J. R. Worcester, H. W. Fitts and R. G. Hartshorne.

ARTHUR W. PARKER, Waltham, Mass., (b. 1844). Educated in public schools of Boston and Ashburnham. From 1863 to 1868 with J. R. Robinson & Co., steam engineers, making and installing steam power plants in mills throughout New England; 1868 to 1876, superintendent of shops, National Bridge and Iron Works; 1877, laying out and building steel dredge-boat, G. W. R. Bailey, for Capt. J. B. Eads, at Pittsburgh, Pa.; 1878 to 1880, detailing and supervising erection of N. Y. Elevated R. R. (8th, 9th and 2d Avenues), for Clark, Reeves & Co. Phoenixville, Pa.; 1880 to 1895, in charge of template department, Boston Bridge Works (having from two to sixteen assistants); 1895 to 1899, chief inspector of steel work for Boston Transit Commission (six assistants); 1899 to 1902, chief inspector of steel work for Boston Elevated Ry. Co., elevated lines construction in shop and field (twelve assistants); and from 1902 to date, superintendent of steel work for Boston Transit Commission on East Boston Tunnel and Washington St. Tunnel. Recommended by J. R. Worcester, J. P. Snow, G. A. Kimball and S. E. Tinkham.

HARRY EDGAR SAWTELL, Medford, (b. 1872). Educated in Lynn public schools. With E. A. Buss, C. E., Boston, four and one-quarter years; with the Cumberland Co. (a part of S. D. Warren Co.) two and a half years; with the engineering department of the Boston Steel & Iron Co. for three years as draftsman, and for two and a half years as chief draftsman, holding that position when company failed; with engineering department of Boston Elevated Ry. Co. six months; with Dean & Main, engineers, for fourteen months, and with C. T. Main, C. E., from January, 1907, to the present time. His principal work has been structural engineering. Recommended by G. A. Kimball, C. T. Fernald, F. M. Ganby, L. S. Cowles and C. T. Main.

GILBERT SMALL, Boston (b. 1885). Graduate Mass. Inst. of Tech., mechanical engineering, 1907. During summers of 1904 and 1905 was employed by the Draper Co. of Hopedale as an assistant to H. S. Dunn of the building department; summer of 1906, as draftsman for J. R. Worcester, C. E., and since June, 1907, with J. R. Worcester & Co. Recommended by J. R. Worcester, G. H. Brazer, E. E. Pettee and Galtano Lanza.



## LIBRARY NOTES.

### RECENT ADDITIONS TO THE LIBRARY.

U. S. Government Reports, Water Supply and Irrigation, Papers Nos. 195, 211, 212, 214, 215, 216, 217.

U. S. Government Reports, Portland Cement Mortars.

“ “ “ Arkansas Coal Fields.

“ “ “ Economic Geology.

“ “ “ Data of Geochemistry.

“ “ “ Purchase of Coal.

“ “ “ Burning of Coal.

“ “ “ Coal Mine Accidents.

“ “ “ Southern Appalachian Mountains.

“ Interstate Commerce Commission Report, 1907.

Maryland, Annual Report on State Highway Construction, 1907.

Metropolitan Park Commission, Annual Report, 1907.

New Jersey State Board of Health, Annual Report, 1907.

Attleboro, Mass., Annual Reports of Town for 1907.

Boston Transit Commission, Report for two years, 1906, 1907.

Burlington, Vt., Annual Report Water Dept., 1907.

Clinton, Mass., Annual Report Water Commissioners, 1907.

Malden, Mass., Annual Report Street and Water Commissioners, 1907.

Medford, Mass., Annual Report Water and Sewer Commissioners, 1907.

Medford, Mass., Annual Report City Engineer, 1907.

Northampton, Mass., Annual City Report, 1907.

Northampton, Mass., Annual Report Water Commissioners, 1907.

North Andover, Mass., Annual Report, Board of Public Works, 1907.

Plainfield, N. J., Annual Report of City for 1907.

Springfield, Mass., Annual Report Water Commissioners, 1907.

Waltham, Mass., Annual Report City Engineer and Superintendent Sewers, 1907.

Worcester, Mass., Annual Report Water Commissioners, 1907.

Worcester, Mass., Annual Report Superintendent Sewers, 1907.

Strength of Chain Links:—Goodenough & Moore.

National Board of Fire Underwriters, Committee on Fire Prevention, Reports on the following cities: Cleveland, Denver, Springfield, Scranton, Louisville, Harrisburg, Indianapolis, Wilkesbarre, Milwaukee, Cambridge, Somerville, Chelsea, Everett, Malden, Quincy, Trenton, Wilmington, Taunton, Nashville, St. Augustine, Brunswick, Jacksonville, Macon, Charlotte, Columbia, Columbus, Ga., Rome, Ga., Tampa, Pensacola, Montgomery, Wheeling, Key West, Roanoke, Petersburg, Lynchburg, Chattanooga, Salem, Gloucester, Grand Rapids, Haverhill, Lewiston, Kansas City, Portland, Me., St. Paul, Bangor, Augusta, St. Joseph, Minneapolis, Lincoln, Berlin, Burlington, Omaha, South Omaha, Fitchburg, Duluth, Marblehead, Superior, Wis., Altoona, Camden, Utica, New Bedford, Hartford and Fall River.

FREDERIC I. WINSLOW, *Librarian*.

## MEETINGS OF THE BOSTON SECTION, AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS.

The regular meeting of the Boston Section of the American Institute of Electrical Engineers will be held Wednesday, May 20, 1908, at 8 p. m., in the auditorium of the Edison Building, 39 Boylston Street, Boston.

The following papers are to be presented: "Comparative Tests of Lightning Protection Devices on the Taylor's Falls System," by Mr. J. F. Vaughan, and "Studies in Lightning Performance, Season of 1907," by Mr. N. J. Neall.

Non-members are cordially invited to attend the meetings, and any such desiring regular notices are requested to communicate with the secretary.

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## MINUTES OF MEETINGS.

### SANITARY SECTION.

A special meeting of the Sanitary Section was held at the Boston City Club, Wednesday evening, April 1, 1908. Mr. W. S. Johnson, Chairman, presided, forty-six members and guests being present.

The recommendations contained in the annual report of the Executive Committee, presented by Mr. A. T. Safford, the retiring Chairman, were considered, and upon motion of Mr. Leonard Metcalf, it was voted to authorize the Chairman to appoint a committee of five to consider the

subject of Uniform Specifications for the Manufacture of Vitrified Sewer Pipe; the committee, if it finds it infeasible for the Section to adopt such specifications, to so report. The Chairman has appointed as this committee: Messrs. Leonard Metcalf, F. A. Barbour, L. D. Thorpe, E. S. Dorr and Charles R. Felton.

The following report of the Committee on Uniform Sewerage Statistics was submitted:

BOSTON, MASS., April 1, 1908.

MR WILLIAM S. JOHNSON,

Chairman, Sanitary Section, Boston Society of Civil Engineers:

*Sir*,—The Committee on Uniform Sewerage Statistics appointed by you at the annual meeting of the Section on March 4, 1908, presents the following report:

This committee was asked to undertake the work of collecting statistics relative to sewerage and sewage disposal in the various cities throughout this part of the country, and to arrange the data obtained in such form that it would be of value to engineers and city authorities.

It was found that considerable work in this connection had already been done by the present chairman of the Section, and that the information obtained, which was for the year 1906, had been tabulated. An examination of these tables has shown them to be of considerable interest. The committee has made some slight changes in their arrangement and has also attended to the work of reviewing and editing which would be necessary before they could be printed.

In view of the fact that the statistics thus far obtained will be useful to engineers in general, as well as to the members of this Section, we suggest that the main Society be requested to authorize the Section to have this table and similar tables which shall be prepared for subsequent years printed in the JOURNAL OF THE ASSOCIATION OF ENGINEERING SOCIETIES. It is also desirable that extra copies be published for distribution among those who do not receive the JOURNAL, but whose cooperation it is desired to secure.

The committee is now at work collecting statistics from as many cities as possible for the year 1907 to be tabulated in a similar manner to those obtained for the previous year.

Respectfully submitted,

HARRISON P. EDDY.  
BERTRAM BREWER.  
C. SAVILLE.

Upon motion of Mr. Charles W. Sherman, it was voted to accept the report and adopt the recommendations of the committee. The clerk was instructed to request the early publication of the report, together with the tabulated information which the committee has obtained, in the JOURNAL OF THE ASSOCIATION OF ENGINEERING SOCIETIES, and to request that extra copies be furnished for the use of the committee.

Mr. George R. King gave a very interesting talk upon Alaska, illustrated by a large number of lantern slides. The meeting tendered a vote of thanks to Mr. King.

IRVING T. FARNHAM, *Clerk*.

BOSTON, MASS., APRIL 15, 1908. — A regular meeting of the Boston Society of Civil Engineers was held at Chipman Hall, Tremont Temple, at 7.30 o'clock P.M., President Joseph R. Worcester in the chair. One hundred and sixty-four members and visitors present.

The record of the last meeting was read and approved.

Messrs. David R. Bates, Austin Cary, James H. Eaton, John A. Garrod, Timothy Guiney, Henry M. McCue, Frederic L. Murray, Edgar A. Norwood, Charles C. Turner and Howard E. Whiting were elected members of the Society and Mr. J. Howard Hayes was elected an associate.

The Secretary announced that under authority of a vote passed at the annual meeting the President had appointed the following special committee to consider the matter presented to the Society in the communication of Mr. Cowles, in relation to increase of membership and clubhouse: L. S. Cowles, G. A. Carpenter, C. R. Gow, R. E. Curtis and C. B. Breed.

The Secretary reported for the Board of Government that under authority of the vote referring to the Board, with full powers, the continuation and appointment of the several special committees of the Society the Board had voted to continue the Committees on Excursions, on the Library and on Quarters, and to discontinue the Committee on Advertisements. The committees as appointed are as follows: —

On Excursions. E. E. Fettee, E. M. Blake, L. B. Manley, R. W. Loud and J. A. Starr.

On the Library. F. I. Winslow, N. S. Brock, W. T. Barnes, M. T. Cook and H. A. Varney.

On Quarters. Desmond FitzGerald, E. W. Howe, G. A. Kimball, F. W. Dean and F. W. Hodgdon.

The Board also appointed the following to represent the Society on the Board of Managers of the Association of Engineering Societies, in addition to the Secretary who is *ex-officio* a member: Dexter Brackett, C. W. Sherman, G. A. Kimball, H. P. Eddy and A. T. Safford.

The Secretary also reported for the Board that it recommended to the Society that the sum of \$50 be appropriated for the use of the Committee of the Sanitary Section on Run-Off of Sewered Areas. The report was accepted and on motion of Mr. Johnson, it was voted, That the Sanitary Section be authorized to expend a sum not exceeding \$50 for the work of the Committee of the Section on Run-Off of Sewered Areas.

Mr. George A. Nelson, for the committee appointed to prepare a memoir of Alfred E. Nichols, a member of the Society, presented and read its report.

The President announced the death of William Vaughan Moses, a member of the Society, which occurred on April 14, 1908. By vote the President was requested to appoint a committee to prepare a memoir. The President has appointed as the committee, Prof. Frank L. Kennedy.

The Secretary read a communication from the Chamber of Commerce of Pittsburg urging early action by the Society approving the calling of a conference by the President upon the subject of the Conservation of the Natural Resources of the United States. After a brief discussion and the passage of a vote expressing the approval of the meeting of the proposed investigation of the subject, it was voted to refer the communication to the Board of Government with full power for action.

Mr. Cowles for the committee appointed to consider the question of larger membership and a clubhouse submitted a brief report stating that



the committee would not be able to investigate the subject and report its findings before the regular meeting in October next and inasmuch as the present lease of the Society's rooms expires on June 1, it recommended that the same be renewed for one year, with the provision that the annual renewals, if possible. On motion of Professor Swain the report was accepted and the recommendation adopted.

The President announced that he should endeavor to call the meetings to order promptly at the hour stated in the notice.

Prof. George F. Swain then spoke briefly on some point in connection with the Quebec Bridge, illustrating his remarks with a large number of lantern slides. A discussion followed in which Messrs. Cowles, Fay, L. J. Johnson, F. B. Sanborn, J. P. Snow and others took part.

Adjourned.

S. E. TENKHAM, SECRETARY.

## PERSONAL NEWS.

Under this heading it is proposed to publish each month personal news relating to members of the Society. All such items of interest should be sent to the Secretary of the Excursion Committee by the first day of each month. The co-operation of members is asked to make this column a success, and they are urged to send in notes even when of a personal nature. (E. M. B. CUT, Secretary, Excursion Committee, 8 Beacon St., Boston.)

Mr. Charles W. Sherman has been elected a member of the Water Board at Belmont, Mass.

Mr. C. Barton Pratt has been appointed deputy superintendent of streets cleaning and watering under Mr. Guy C. Emerson, at Boston.

Mr. William E. Foss has been engaged by the Board of Water Works of Newark, N. J., to investigate the electrolysis of water mains in that city.

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Mr. Rudolph Hering has been appointed on the New Montclair Municipal Art Commission which was organized by the Montclair Civic Association.

Mr. Walter Shepard, chief engineer of the Boston & Albany R. R., has been made consulting engineer, and Mr. Everett E. Stone, assistant chief engineer at Springfield, Mass., has succeeded him as chief engineer.

Prof. Hector J. Hughes, now assistant professor of hydraulics and sanitary engineering in Harvard University, has been appointed assistant professor of civil engineering, his new duties to be assumed next September.

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Mr. W. H. Balch of the Aberthaw Construction Co. is at the present time employed as expert in charge of removing centers under a large concrete arch at Spokane, Washington. The past summer he was in J. C. Trautwine's office in Philadelphia working up the reinforced concrete section of the *Engineer's Pocket-book*.

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Mr. E. S. Larned has written a critical review of the proposed Edison Thousand Dollar Concrete House, so-called. This article appears in the March, 1908, issue of *Cement Age*, and in the May issue of the same publication Mr. Larned gives a description of the New Monolithic Duct System, which is of particular interest to the engineers of the telephone and electric light companies.

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Mr. Guy C. Emerson has been appointed superintendent of streets of Boston. Under a recent ordinance consolidating various departments, he will have charge of the work formerly under the departments of streets, sewers, sanitary, street cleaning and watering, bridges, lamps and ferries. Mr. Emerson was deputy superintendent of streets in 1900 and later became acting superintendent. Recently he has been construction engineer in the United States Reclamation Service.

## NEW ENGINEERING WORK.

(Under this head the Excursion Committee proposes to present each month a brief résumé of engineering work in progress in New England, as far as such information is readily obtainable. The assistance of members is desired, and items of interest will be gladly received. Such items are intended to include not only works of exceptional magnitude or containing novel features, but also engineering construction work of all kinds and all degrees of magnitude. Notes should be in the hands of the Committee not later than the 2nd Wednesday of each month. The thanks of the Committee are due to the members who have furnished data for the Bulletin.—E. M. BLAKE, Secretary, Excursion Committee, 8 Beacon St., Boston.)

**Commonwealth of Massachusetts.**—CHARLES RIVER BASIN COMMISSION. — *Work in Progress at the Dam and Lock.* — Building portion of shut-off dam extending easterly from the Cambridge coffer-dam; tearing away coffer-dams on both sides of river; installing electrical apparatus for operating lock-gates and for operating filling gates in lock-gates.

*Boston Embankment and Boston Marginal Conduit.*—Work is in progress all the way from the new Cambridge Bridge to the Back Bay Fens, and work has been nearly completed on the coffer-dams for the gate-house at the outlet of the Stony Brook channels at the Fens.

*Cambridge Marginal Conduit.*—It is being constructed in Commercial Avenue in East Cambridge, using a cableway. A siphon under the Lechmere Canal, consisting of two lines of 48-inch pipe, is nearly ready for testing.

METROPOLITAN WATER AND SEWERAGE BOARD, WATER WORKS.—Water was allowed to pass over the overflow of the Wachusett Dam at Clinton for the first time on March 29th. Water in the reservoir at this time stood about one foot below high water mark. An appropriation of \$3700 is before the Legislature for the purchase of new iron braces for the flash boards, and pending the installation of these braces the flash boards originally placed were removed and water allowed to pass over the crest.

SEWERAGE WORKS.—The East Boston pumping station in the North Metropolitan Sewerage System was practically destroyed in the Chelsea fire on April 12th. The building was of brick construction and the interior was completely gutted, the roof falling down onto and injuring the machinery. At this station were located three submerged centrifugal pumps with impellers or wheels 8.25 feet in diameter, driven by triple expansion engines of the Reynolds-Corliss type. The contract capacity of these pumps was 45,000,000 gallons each with 19 feet lift, and the average quantity raised per day in 1905 was 52,400,000 gallons of sewage. Immediately following the fire the wreckage was cleared out and a new temporary roof put on. By using parts of pumps No. 1 and No. 2 pump No. 3 was put into condition and its operation begun again at 2 P. M. April 26th. The new parts for pumps No. 1 and No. 2 have been ordered from the builders, and these pumps are being fixed up as quickly as possible. During the two weeks previous to the time when pump No. 3 was again put into operation, part of the sewage went through the station to the overflow at Deer Island, and the rest went out through the overflow at the station into the river. The future disposal of this sewage pumping station is still problematical.

METROPOLITAN PARK COMMISSION.—*Middlesex Fells Parkway.*—The work of constructing roadways from present ending near Forest Street to the Middlesex Fells Reservation and sub-grade for electric railway is in progress.

*Middlesex Fells Reservation.* — Plans are being prepared for construction of reinforced concrete bridge for electric railway in Middlesex Fells Reservation.

*Mystic River Reservation.* — Bids were received on May 4, 1908, for construction of reinforced concrete bridge for driveway over Alewife Brook, span 40 feet, width 55 feet.

Bids were received on May 5, 1908, for completion of work of constructing boat lock, dam, tide-gate chambers, weirs and sluices near Cradock Bridge, Medford.

**HARBOR AND LAND COMMISSION.** — The work of dredging the Anchorage Basin in Boston Harbor to 30 feet deep at mean low water is still in progress.

Work is about to commence on the dredging of a channel 35 feet at mean low water from the Government Channel into the dock of the Cunard Steamship Co. at East Boston.

The dredging of the Reserved Channel at South Boston is also still in progress, making the channel from 200 to 300 feet wide and 20 feet deep at mean low water.

The improvement of Menemsha inlet at the western end of Martha's Vineyard by building stone jetties and dredging a channel and anchorage basin is still in progress. The jetties are practically finished, and the dredging will be finished in the course of the next six weeks.

The improvement of the West Bay entrance at Osterville has just been commenced. This involves the removal of the old western timber jetty and the construction of a new western jetty 100 feet further west, making the entrance 200 feet wide and the dredging of the full width of the new addition.

The work of constructing a boat harbor at Deacon's Pond, Falmouth, has been commenced, stone being placed for the jetties and riprap, and the dredging will be commenced about the middle of May.

The enlarging of the jetties at Cuttyhunk is now actively in progress.

The work of extending the concrete sea-walls at North Scituate has just been commenced.

**HIGHWAY COMMISSION.**— State highways are now under construction in the following cities and towns :—

Ashby (Willard Brook Bridge),  
Belchertown (Maple Street and Granby Road),  
Charlton, (Southbridge Street),  
Franklin (Central Street),  
Freetown (River Road),



Gloucester (Eastern Avenue),  
 Groton-Pepperell (Bridge at Nashua River),  
 Haverhill (Bradley Avenue),  
 Le Rox (Kemble Street),  
 Palmer (Warren Road),  
 Southboro (Ashland Road),  
 Southbridge (Hamilton Street),  
 Warren (Palmer Road),  
 Webster (Thompson Road).

**Boston Transit Commission.**— It is expected that the Washington-Street Tunnel work which will be in progress about May 15, 1908, will consist mainly of tiling, plastering, painting and other interior finish.

**City of Boston.** — **ENGINEERING DEPARTMENT.** — *Chelsea Street Bridge.*— The Chelsea fire of April 12th destroyed the Chelsea Street Bridge connecting East Boston and Chelsea. It was a pile bridge 345 feet long with an iron swing draw 118 feet long about midway between the abutments. The fire burned off the caps and tops of the piles and most of the flooring on the East Boston section. The draw had been partially turned off and considerable of the wooden flooring was burned. Some of the stringers were entirely burned off at their bearings on the steel floor beams, the middle part being held by the planking which was spiked to the stringers. Some of the samson rods were broken and the corners of the draw settled down, one corner settling about 12 feet. The girders were warped out of line and the web plates were buckled. One corner of the draw which rested on the Chelsea section was uninjured. The wooden draw foundation and draw pier were largely destroyed. The stones in the East Boston abutment were spawled, the faces being left rounding, and one corner of the abutment has since fallen.

The old channelway was 36 feet wide, and it is proposed to rebuild with a channelway 60 feet wide.

*Northern Avenue.*— Bids were received on April 16, 1908, and a contract made with the lowest bidder, William L. Miller of Boston, for building sea walls and a timber bulkhead along the northerly line of Northern Avenue at Docks Nos. 2 and 3, at the South Boston Flats. The wall at the head of Dock No. 2, which is 43 feet 9 inches high, requires a very deep foundation to allow the dock to be dredged to a depth of 30 feet below mean low water. The underlying soil is a soft clay, and piles must be driven to a depth of 57 feet below city base. The foundation of the wall to Elevation 0, or city base, is to be of Portland cement concrete, a 1-2-4 mixture, and above this elevation the wall will have a

granite face and concrete backing. The length of this wall is 218 feet. The wall at the head of Dock No. 3 is to be of granite laid dry and will have a shallow foundation of Portland cement concrete, extending only about 2 feet below city base. Piles must be used under this wall. The length of this wall is 171 feet. Between these two dock walls a timber bulkhead about 184 feet long is to be built along the end of the proposed pier. The contract also covers the necessary filling of the street back of the walls and bulkhead. Work to be completed Oct. 15, 1908.

**Boston Elevated Railway.**—ELEVATED AND SUBWAY CONSTRUCTION.—*Forest Hills Extension.*—Foundations for the extension of the elevated structure from the end of the present steel structure to Walk Hill Street south is under way. Foundations of extensive character are being built to span Stony Brook in Forest Hills Square, and near the crossing of Washington Street under the N. Y., N. H. & H. R. R.

*Washington-Street Tunnel, South Approach.*—Work is going on erecting the steel, building the concrete incline on Ash Street from Oak Street north. The switch tower at the junction of Castle and Washington Streets is being moved preparatory to the installation of switches and signals governing the new junction at this point.

*North Approach.*—Excavation is partly completed and foundations have been constructed for a portion of the new steel work for the incline from Travers Street north. Steel work has been let for this portion of the work to the Pennsylvania Steel Co., and erection will begin during this month. The Raymond Concrete Piling Co. have a contract to drive a number of piles on this work for the foundations of the incline walls.

*East Cambridge Extension.* Piles have been driven and the curbing or sheeting built for three of the water piers for the new Charles River Bridge; one of the piers on the East Cambridge shore is about one-half completed and may be inspected at any time. This pier is substantially of the same design as those to be constructed and will give one idea of what the completed structure will be. The Contractor has established a large concrete mixing plant in the river just north of the piers and will soon be in a position to place the concrete in three of the adjacent piers.

**Boston & Maine Railroad.**—SEPARATION OF GRADES, BELMONT, MASS.—The work consists of raising the tracks of the Southern and Fitchburg Divisions about 5 feet and depressing the

streets to go through a granite arch of 65 feet span under the tracks. The work also includes a new station, which is just begun. The other work in general is about completed.

**New York, New Haven & Hartford Railroad.** ELIMINATION OF GRADE CROSSING, NEW BEDFORD, MASS. About 30,000 cubic yards of concrete have been used in 7 highway bridges and retaining walls. The work done has included a large turntable, power coaling plant, ash-pits, water supply, new brick freight houses, large storage and brick delivery yards. The masonry work has been completed, and the work of filling, track laying and erection of steel bridges is in progress.

ELIMINATION OF GRADE CROSSING, WORCESTER, MASS.—Work on the \$2,500,000 abolition has begun. Contracts have been let for Cambridge and Southgate Streets, South Worcester, and the work of lowering the water pipes has begun.

ELIMINATION OF GRADE CROSSING, BARNSTABLE, MASS. Work on changing the highway, on the north bound station and the express building has begun.

ELIMINATION OF GRADE CROSSING, FAIRMONT AVENUE AND BRIDGE STREET, HYDE PARK, MASS. Work has been started on 2 overhead bridges and a 70-foot concrete arch across Neponset River, with approaches.

ATTLEBORO, MASS.—The construction of the 2-story brick station with elevator for combined use of passengers and express was completed about May 1st.

PROVIDENCE, R. I.—The double track railroad tunnel, 5,080 feet in length, is about three-quarters finished. The headings were joined on April 5th, with an error of alignment of  $\frac{1}{2}$  inch and an error in grade of  $\frac{1}{4}$  inch; McCabe & Bikler, Contractors.

The roller lift double track drawbridge over the Seekonk River near the present station is being completed by Holbrook, Cabot and Rollins, and the superstructure being finished by the Phenix Bridge Company. The viaduct for four or more tracks near the station is being erected by C. W. Blakeslee & Sons, Contractors for the substructure. The superstructure is being finished by the Eastern Steel Company, Shoemaker & Company and S. W. Bowles Company.

SOMERSET, MASS.—A new double track drawbridge over Taunton River is being built in place of the old, light single track drawbridge built by the Keystone Bridge Company in 1877.

The drawbridge is to be a center bearing swing bridge 320 feet long, operated by electricity from the railroad's power house

at Warren, R. I., and giving two waterway openings for navigation of 100 feet in the clear each. It will contain about 2,000 tons of steel and is being built by the Phoenix Bridge Company. The remainder of the bridge, about 1,200 feet, is to be pile trestle. Nearly all these piles have been driven in place and the greater portion of the top has been built. About one-half of the steel for the drawbridge has been delivered on the ground, false work is being put in place and the actual erection of the bridge will probably commence about May 18, 1908. During the erection of this bridge a temporary lift bridge for the passage of navigation will be maintained.

**Boston & Albany Railroad.** — *Beacon Park Engine House.* Foundations for new Beacon Park 30-stall engine house and power plant, construction of which has been carried on through the winter; and work will start shortly on the superstructure of reinforced concrete.

*Third Track Work.* — The Boston & Albany intends to begin construction of additional third track this year at various locations along its line, as noted below.

Plans are being prepared and work is already being done at Richmond Summit by Walsh-Kahl Company. The third tracks, as contemplated, will be located as follows:

- Jamesville to Webster Junction,  $2\frac{3}{4}$  miles.
- South Spencer to East Brookfield,  $2\frac{1}{2}$  miles.
- Washington to Hinsdale,  $4\frac{1}{4}$  miles.
- West Pittsfield to Richmond Summit, 2 miles.
- State Line,  $\frac{1}{2}$  mile.
- East Chatham  $\frac{1}{2}$  mile.
- Paine's Mill,  $\frac{1}{2}$  mile.
- Chatham to Niverville, 8 miles.
- East Greenbush to M. P. No. 198, 3 miles.

This work involves considerable heavy grading and rock work, and extension of culverts and bridges.

*Chelsea Creek Bridge.* — About 350 feet of the pile bridge of the Boston & Albany Railroad at Chelsea Creek was destroyed during the Chelsea fire, including 50-foot steel truss draw bridge. One track was opened up on the Saturday following the fire, the trestle being built in permanent shape with a temporary pile structure through the draw opening. Plans are being made for the rebuilding of the second track and a new draw span. This work will be started at once.



**Springfield, Mass.**—The City of Springfield is developing as a new supply the Little River, a stream which comes down from the western towns of Hampton County.

In September, 1907, the contract was let to the Culgin-Pace Contracting Company of New York City for 4530 feet of rock tunnel and a concrete arched dam. Work has progressed on this throughout the winter and the force is being increased so that the dam can be completed during the present season. This involves 9500 yards of cyclopean masonry. The tunnel is being worked from both ends and is in a total of 1400 feet. Concrete to be completed September, 1909.

Three acres of covered masonry filters are also to be constructed for this supply near the portal of the tunnel, together with an earth dam 30 feet high and 600 feet long to form a sedimentation basin to be used in the control of the water to the filters. This contract was taken by the Charles R. Gow Company of Boston. Work has been started on all portions of this contract. This work is to be completed Oct. 1, 1909.

Contract No. 3 is to be the Provin Mountain Reservoir. A covered concrete reservoir 4 miles from the city, with a total capacity of about 16,000,000 gallons. This contract will be let about June 1st. This contract is also to be completed Oct. 1, 1909.

A 38-inch and 42-inch pipe line from the filters to the city, via the Provin Mountain Reservoir, will be contract No. 4. This also is to be completed during the following two seasons.

The remaining two portions of the work to bring the new supply into the city will be the construction of an earth dam impounding about two billion gallons on one of the tributaries of the stream and the river crossing. These will not be let during the present season. In the city the larger portion of the remaining cement-lined pipes are to be replaced by cast iron, and a large extension to the 30-inch circuit, which is to supply water to all parts of the city, will be laid during the coming season. Something over \$100,000 will be expended for this work.

**Fall River-Somerset Bridge.**—The Railroad Commissioners, the Harbor and Land Commissioners and the County Commissioners of the County of Bristol were constituted a Joint Board by Chapter 462 of the Acts of 1903, and directed to locate and construct a new drawbridge over Taunton Great River, between the city of Fall River and the town of Somerset, with the necessary approaches and ways thereto, at a cost not to exceed \$1,000,000.

On Dec. 17, 1906, proposals for the construction of this bridge and its approaches, in response to advertised notice, were received by the Joint Board, and contract awarded to the Holbrook, Cabot & Rollins Corporation of Boston, Mass.; the contract price being \$770,000 for the entire bridge and approaches, the contractor to complete all work and have the bridge open and ready for public travel on or before Aug. 30, 1908. The cost and expense of constructing this bridge and of acquiring and constructing the necessary approaches and ways are borne by the county of Bristol in the first instance.

The plans and specifications are for a bridge and approaches, practically at right angles to the river, covering about 2363 lineal feet of construction, including changes in present street grades made necessary by new approaches. The bridge will have a driveway of 44 feet in the clear between curbs, with footway or sidewalks 8 feet wide, with roadway completed in surface by a brick and wood pavement laid without grade in line of traffic, sidewalks in wood surface throughout. Approaches will be finished by macadam pavement in maximum grade rate of 3 per cent. with granite curb and gutters defining roadway. Sidewalks over approaches will be in granolithic finish, and the embankment slopes of approach will be completed by a protecting grass sodding. A protecting hand rail will be placed throughout adjoining sidewalks on both sides of the bridge and approaches. The portion of roadway construction directly over the river will be supported by trusses of steel resting upon masonry piers, the balance of roadway in shape of bridge approaches, about 1673 feet in length, will be in earth.

The bridge over river, some 922.5 feet in length between faces of masonry, will have a superstructure of rectangular design riveted throughout, supporting roadway on its upper members 40 feet above mean low water, and will be made up of 5 fixed spans, 3 of 200 feet, 2 of 100 feet, with clearance of 17 feet at mean low water, and a draw span over channel of roller lift design in two leaves rolling in opposite directions, giving clear channel way of 100 feet between fenders, and a clearance when closed of 34 feet at mean low water, with draw so controlled in operation as to occupy not more than 1 minute in complete opening.

Superstructure will be supported by a substructure of two abutments and five piers of substantial masonry, with piers supporting roller lift 80 feet by 22 feet in dimension at foundation level and 80 feet in height, carried in pneumatic caissons through 50 feet of water to solid rock bed some 64 feet below mean low

water; balance of substructure cared for in foundations by piling driven through sand and gravel to rock bottom, or upon piling driven to refusal in the compact material of river bottom, the foundation depths varying from 15 feet to 40 feet below mean low water.

A timber fender some 300 feet in length adjoining channel piers gives protection to water craft using channel. Bridge and fenders will be lighted throughout by electricity.

On May 1, 1908, approximately 93% of the work covered by the above contract had been completed.

Early on Sunday morning, April 26, 1908, an attempt was made to wreck this bridge by firing some explosive in the bottom of the end posts of the middle trusses of the first and second spans on the Fall River end over the pier. The damaged members are being replaced, and it is not expected that any material delay in the completion of the bridge will be caused by the explosion. This bridge is being erected under the immediate charge and direction of Mr. E. K. Turner, engineer in chief for the Joint Board.

**Brockton, Mass.**—The foundations for two small pumping stations for high service districts are in progress of construction. In these stations will be installed gasoline and electric pumping units, with small triplex pumps. Work on 7 intermittent filtration beds is being carried on by the use of wheel scrapers, and concrete carriers are being constructed together with 5 inch underdrains. The triple expansion 6,000,000 gallon pumping engines at the Silver Lake Station are reported to be performing daily high duty.

**Newburyport, Mass.**—The contract for about 2 miles of 12-inch forcemain and a small brick pumping station located on the State Road at the Artichoke River has been let to Cashman Brothers. The Charles J. Jager Company is installing a 1,000,000 gallon vertical triplex Deming pump and one 40 H. P. Mietz & Weiss Crude Oil Engine. The study of the proposed filtration disposal area is being made by Mr. Lewis D. Thorpe, engineer for the town, and by Mr. William S. Johnson as consulting engineer.

**Milton, Mass.**—Aberthaw Construction Co. are now building the tower of the Blue Hill Observatory at the top of Great Blue Hill. This is hollow wall, concrete floors and a concrete battlemented top.

**South Framingham, Mass.**—J. J. Van Valkenburgh, town engineer of South Framingham, has driven about 40 wells in the

southern section of Framingham in contemplation of changing the water supply from Farm Pond. An electric station will be erected probably on the line of the N. Y., N. H. & H. R. R. that will supply power for the contemplated water pumping station, and also to the sewer station, where there now is an electrically driven pump of 2,000,000 gallons capacity in 24 hours, the power for which is at present purchased.

**Westfield, Mass.**—Bids were received on April 29th for furnishing about 4,600 feet of 8-inch to 24-inch sewer pipe.

**Pittsfield, Mass.**—An extension of about 3 miles of water mains is being laid by the city by day labor.

**Somerville, Mass.**—About \$9,000 is being expended for the extension of water mains.

**Norwood, Mass.**—The contract for constructing section No. 1 of the new sewerage system has been awarded Moore & Co. of Boston at a total of \$37,353, and for section No. 2 to Charles G. Craib & Company of Winthrop. The work is in charge of Lewis D. Thorpe, C. E., Cornhill Building, Boston, Mass.

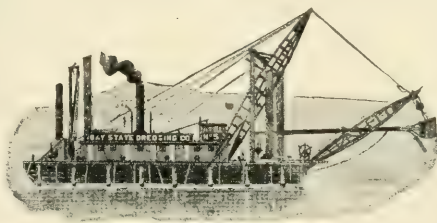
**Provincetown, Mass.**—The installation of the new water supply at North Truro, which was begun last fall, is practically completed. Experiments covering a period of 7 months were made in 1906 on slow sand filtration of the present supply, which was installed in 1888. The presence of an excess of iron, somewhat similar to the conditions met at Reading, had rendered the old supply practically useless for drinking and laundry purposes. Slow sand filtration, with the use of aluminum sulphate, was entirely successful in removing the iron and making the water clear and colorless. Test wells were driven in North Truro, about 1 mile west from Highland Light, and an excellent supply of ground water was found, free from iron. It was, therefore, decided to adopt this new supply, instead of installing a filtration plant. The new steam-pumping plant, consisting of a 1,000,000-gallon Laidlaw-Dunn-Gordon pumping engine, is expected to be put into operation on about May 15th. The engineering work for this new supply is under the charge of Blake & Symonds, 8 Beacon Street, Boston, Mass.





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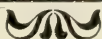


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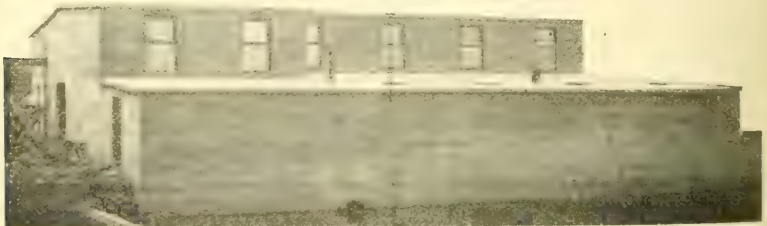
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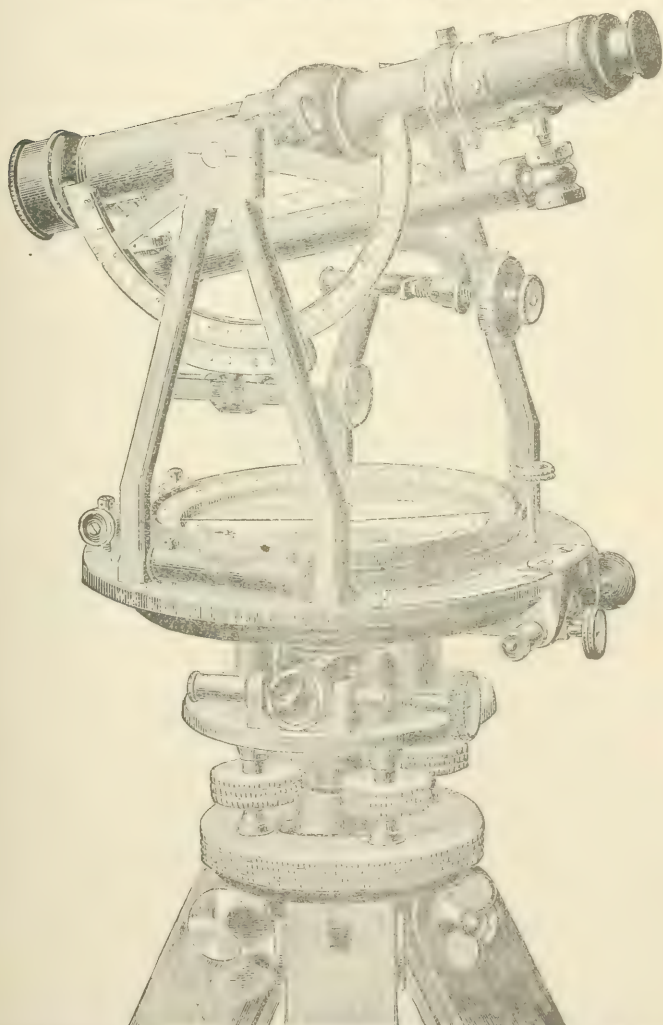
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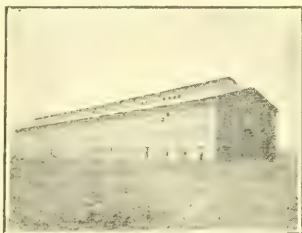


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# BOSTON SOCIETY OF CIVIL ENGINEERS.

ORGANIZED JULY 3, 1848.

## MONTHLY BULLETIN.

NEW SERIES.

JUNE, 1908.

No. 23.

### REGULAR MEETING.

A regular meeting of the Boston Society of Civil Engineers will be held on Wednesday, June 17, 1908, at 7.30 p. m., in the

SOCIETY ROOMS, 715 TREMONT TEMPLE.

**BUSINESS OF THE MEETING:** To ballot on the applications for membership as announced in this notice.

As the meeting comes on a holiday, no arrangements have been made for a paper.

It is probable that the meeting will adjourn to Saturday, July 4th, at The Mount Pleasant, Bretton Woods, for exercises in connection with the sixtieth Anniversary.

S. E. TINKHAM, *Secretary*.

### CANDIDATES FOR MEMBERSHIP.

To be balloted on at meeting, June 17, 1908.

#### AS MEMBERS.

ARMAND WILLIAM BENOIT, Lawrence, Mass., (b. 1883). Graduated from Tufts College in 1907 with degree of B.S. in civil engineering. Summer of 1905 was assistant engineer at the plant of the United Shoe Machinery Co., Beverly; summer of 1906 was assistant engineer under Ransome & Smith of New York on extension of same plant; and summer of 1907 had charge of some concrete construction in Lawrence; at present with William Wheeler, C. E., Boston. Recommended by R. S. Weston, William Wheeler, C. W. Sherman and Leonard Metcalf.

HARALD DONALD JONES, Boston, (b. 1883). Civil engineering course at Cornell University, 1902-03. Time keeper, Portland Co., 1904; with Megquier & Jones Co., 1905; with New Jersey Bridge Co. 1906; and drafting and estimating for W. F. Kearns Co., 1907, and at the present time. Recommended by G. H. Brazier, J. R. Worcester, H. W. Fitts and R. G. Hartshorne.



ARTHUR W. PARKER, Waltham, Mass., (b. 1844). Educated in public schools of Boston and Ashburnham. From 1863 to 1868 with J. R. Robinson & Co., steam engineers, making and installing steam power plants in mills throughout New England; 1868 to 1876, superintendent of shops, National Bridge and Iron Works; 1877, laying out and building steel dredge-boat, G. W. R. Bailey, for Capt. J. B. Eads, at Pittsburgh, Pa.; 1878 to 1880, detailing and supervising erection of N. Y. Elevated R. R. (8th, 9th and 2d Avenues), for Clark, Reeves & Co. Phoenixville, Pa.; 1880 to 1895, in charge of template department, Boston Bridge Works (having from two to sixteen assistants); 1895 to 1899, chief inspector of steel work for Boston Transit Commission (six assistants); 1899 to 1902, chief inspector of steel work for Boston Elevated Ry. Co., elevated lines construction in shop and field (twelve assistants); and from 1902 to date, superintendent of steel work for Boston Transit Commission on East Boston Tunnel and Washington St. Tunnel. Recommended by J. R. Worcester, J. P. Snow, G. A. Kimball and S. E. Tinkham.

HARRY EDGAR SAWTELL, Medford, (b. 1872). Educated in Lynn public schools. With E. A. Buss, C. E., Boston, four and one-quarter years; with the Cumberland Co. (a part of S. D. Warren Co.) two and a half years; with the engineering department of the Boston Steel & Iron Co. for three years as draftsman, and for two and a half years as chief draftsman, holding that position when company failed; with engineering department of Boston Elevated Ry. Co. six months; with Dean & Main, engineers, for fourteen months, and with C. T. Main, C. E., from January, 1907, to the present time. His principal work has been structural engineering. Recommended by G. A. Kimball, C. T. Fernald, F. M. Ganby, L. S. Cowles and C. T. Main.

GILBERT SMALL, Boston (b. 1885). Graduate Mass. Inst. of Tech., mechanical engineering, 1907. During summers of 1904 and 1905 was employed by the Draper Co. of Hopedale as an assistant to H. S. Dunn of the building department; summer of 1906, as draftsman for J. R. Worcester, C. E., and since June, 1907, with J. R. Worcester & Co. Recommended by J. R. Worcester, G. H. Brazer, E. E. Pettee and Galtano Lanza.

## APPLICATIONS FOR MEMBERSHIP.

The following applications for membership have been received and are now before the Board of Government for approval. Members having information which will assist the government in its consideration of these applications are requested to communicate at once with any member of the Board. Communications will be regarded as confidential and for the use of the Board alone.

### AS MEMBERS.

JAMES RUMFORD BALDWIN, Woburn, Mass., (b. 1880). Graduated from Winchester, Mass., High School in 1899, and entered the employ of the Solvay Process Co. of Syracuse, N. Y., working mostly on boiler and engine tests; attended Mass. Institute of Technology, 1900-01; entered

Harvard University in 1901; during summers of college course, worked as rodman and instrument man for Locks and Canals Co. of Lowell, and for the Essex Co. of Lawrence; graduated from Lawrence Scientific School in 1905; since graduation has worked for A. T. Safford of Lowell and Charles T. Main of Boston on hydraulic investigations and developments; and at present is employed by Locks and Canals Co. of Lowell. Recommended by A. T. Safford, G. M. Mansur, R. A. Hale and C. T. Main.

JOHN VANDERVEER BEEKMAN, JR., Boston, (b. 1874). Graduated from Mass. Institute of Technology in course of structural engineering in 1900. Summer of 1900, draftsman for Levering & Garrigues, New York; 1900 to 1901, designing mill buildings for Edison Portland Cement Co.; 1901 to 1902, with Purdy and Henderson, civil engineers of New York; 1902 to 1904, in charge of Purdy and Henderson's drafting rooms, Boston; and from 1904 to date, manager for Purdy and Henderson. Recommended by G. F. Swain, J. R. Worcester, R. E. Curtis and W. S. Johnson.

JAMES MANNING McNULTY, Boston, (b. 1881). Graduated from Boston English High School in 1897 and took advanced course in 1898. Entered the Engineering Department, Boston, in 1898 and has been employed there to date, starting as rodman and is now assistant engineer. Recommended by F. A. McInnes, F. I. Winslow, M. T. Cook and S. H. Thorndike.

LUIS GONZAGA MORPHY, Newton, Mass., (b. 1876). Received B. A. degree in Mexico City and B. S. at Spring Hill College, Mobile, Ala., and attended Rensselaer Polytechnic Institute, Troy, two and one-half years. Has been engaged in continuous practice of engineering since Jan., 1900, having successively engaged as assistant supervisor of track, acting supervisor of track, assistant engineer in M. of W. dept.; assistant engineer in construction department; resident engineer and assistant to principal assistant engineer, on the N. Y. C. & H. R. R. R.; then transferred to B. & A. R. R. as assistant engineer of M. of W. and construction and recently appointed assistant to chief engineer of the latter company. Recommended by Walter Shepard, William Parker, W. G. S. Chamberlain and W. C. Whitney.

HENRY BLANCHARD PRATT, Waltham, Mass., (b. 1877). Graduated from Waltham High School in 1895. Engineering Dept., Cambridge, 1895-98; with 5th Regiment, U. S. V., 1898-99; with G. E. Sleeper, C. E., on street railway location, April-July, 1899; and since July, 1899, with J. R. Worcester and J. R. Worcester & Co. At present assistant engineer in charge of Waltham office of J. R. Worcester & Co. Recommended by J. R. Worcester, G. H. Brazier, E. E. Pettee and C. C. Turner.

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## MINUTES OF MEETINGS.

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### MAY MEETING OF THE SOCIETY.

Boston, Mass., May 20, 1908.—A regular meeting of the Boston Society of Civil Engineers was held in Chipman Hall, Tremont Temple, at 7.30 o'clock P.M., President J. R. Worcester in the chair; seventy-eight members and visitors present.

The record of the last meeting was read and by vote approved.

Mr. Erasmus D. Leavitt was elected an honorary member and Messrs Charles F. Breitzke, Maurice F. Brown, Howard L. Coburn, Arthur W. Emerson, George F. Hobson, Arnold Seagrave, Arthur E. Tarbell, Ernest M. Trefethen and Joseph F. Wilber members of the Society.

The President reported for the Board of Government in the matter referred to it at the last meeting in relation to the proposed conference on the conservation of the Natural Resources of the Country, that it had invited Prof. George F. Swain to represent the Society at that conference so far as an opportunity presented itself, and to express the approval of the Society as shown by the vote at the last meeting.

The Secretary read a communication from the Mayor of Boston calling attention to an act of the Legislature of 1907 authorizing the Mayor to appoint a member of the Board of Appeal, the member so appointed to be selected from "two candidates, one to be nominated by the Boston Society of Architects and one by the Boston Society of Civil Engineers." On motion of Professor Allen, the communication was referred to the Board of Government with full power.

Prof. F. L. Kennedy, the committee appointed to prepare a memoir of our late associate William V. Moses, submitted and read his report.

Mr. James E. Howard, C. E., read the paper of the evening entitled, "Some causes which tend toward the fracture of Steel Rails."

The Secretary read, in the absence of its author, a discussion on the subject of the paper by Mr. J. Parker Snow. Further discussions were offered by Prof. Henry Fay of the Mass. Institute of Technology; by Mr. William A. Aiken of New York, and Mr. George A. Kimball, Chief Engineer, and Mr. H. M. Stewart, Road Master of the Boston Elevated Railway Co.

Adjourned.

S. E. TINKHAM, *Secretary*.

## JUNE MEETING OF SANITARY SECTION.

A regular meeting of the Sanitary Section was held at the Vespar Country Club, Lowell, Mass., June 3rd. Mr. Frederic William Huntington was elected a member of the Section. The members in attendance viewed the Massachusetts State Board of

Health Experiment Station at Lawrence, Mass., which was described by Mr. Stephen DeM. Gage. The party then proceeded to the Lawrence Pumping Station where Mr. Arthur D. Marble read a paper describing the inception, construction and operation of the Lawrence water filters. The driven wells and pumps at Lowell, Mass., were inspected by the party and described by Mr. George Bowers. Present 34 members.

IRVING T. FARNHAM, *Clerk.*

## LIBRARY NOTES.

### RECENT ADDITIONS TO THE LIBRARY.

C. R. Grimm:—Secondary Stresses in Bridge Trusses.

Slason Thompson:—Cost and Value of American Railways.

A. R. Hirst:—Earth Roads.

“ “ The Earth Road Drag.

“ “ Stone and Gravel Roads.

“ “ Culverts and Bridges.

Hudson and Garland:—Tests of Liquid Air Plant.

A. N. Talbot:—Tests of Concrete Columns.

Theodor Fischer:—City Building.

Proceedings of American Railway Master Mechanics' Association, 1898–1903; 6 vols.

New Jersey, Annual Report of Public Roads, 1907.

Massachusetts Metropolitan Water and Sewerage Report, 1907.

Beverly, Mass., Annual Report Water Board, 1907.

Brockton, Mass., Annual Report City Engineer, 1907.

Fitchburg, Mass., Annual Report City Engineer, 1907.

Gloucester, Mass., Annual Report City Engineer, 1907.

Gloucester, Mass., Annual Report Water Commissioners, 1907.

Haverhill, Mass., Annual Report City Engineer, 1907.

Madison, Wis., Annual Report Water Dept., 1907.

Minneapolis, Minn., Annual Report Water Works, 1907.

New Haven, Conn., Report of National Board Fire Underwriters.

Providence, R. I., Quarterly Report Dept. Public Works.

Providence, R. I., Annual Report City Engineer, 1907.

Woburn, Mass., Annual Report Water Dept., 1907.

FREDERIC I. WINSLOW, *Librarian.*



## PERSONAL NEWS.

(Under this heading it is proposed to publish each month personal news relating to members of the Society. All such items of interest should be sent to the Secretary of the Excursion Committee by the first day of each month. The co-operation of members is asked to make this column a success, and they are urged to send in notes even when of a personal nature.—E. M. BLAKE, Secretary, Excursion Committee, 8 Beacon St., Boston.)

Mr. Otis F. Clapp has been re-elected city engineer at Providence, R. I.

\* \* \*

Mr. Lewis M. Hastings has been reappointed city engineer of Cambridge, Mass.

\* \* \*

Mr. William S. Johnson has been elected a member of the Executive Committee of the Society of Arts.

\* \* \*

Mr. H. W. Clark is in Europe studying water and sewer purification works. He will be gone for about ten weeks.

\* \* \*

Mr. Rudolph Hering went abroad April 28th with his family for a stay of three months in Europe, where he will investigate water, sewage and garbage disposal plants.

\* \* \*

Mr. William E. McClintock has been appointed Chairman of the Chelsea Board of Control. This Board is the new form of municipal government which the Legislature adopted for the City of Chelsea.

\* \* \*

Mr. Harold Parker has been made Chairman of the Massachusetts Highway Commission in place of Mr. W. E. McClintock who resigned.

\* \* \*

The President has appointed Prof. Geo. F. Swain a member of the National Conservation Commission. The commission is to consider and advise the President on questions relating to the conservation of the natural resources of the country.

## NEW ENGINEERING WORK.

(Under this head the Excursion Committee proposes to present each month a brief résumé of engineering work in progress in New England, as far as such information is readily obtainable. The assistance of members is desired, and items of interest will be gladly received. Such items are intended to include not only works of exceptional magnitude or containing novel features, but also engineering construction work of all kinds and all degrees of magnitude. Notes should be in the hands of the Committee not later than the 2nd Wednesday of each month. The thanks of the Committee are due to the members who have furnished data for the Bulletin.—E. M. BLAKE, Secretary, Excursion Committee 8 Beacon St., Boston.)

**Commonwealth of Massachusetts.**—**CHARLES RIVER BASIN COMMISSION.**—- *Work in Progress at the Dam and Lock.*— Portions of the coffer-dam have been torn away at the upper and lower ends of the lock, piles are being driven for the rest pier at the upper end of the lock, the filling-gates in the lock-gates are ready for operation as soon as the switchboard can be set up and connected, and bearing timbers are being fitted to the lock-gates. On the Cambridge side of the river the switchboard is being set up and limit switches are being placed for operating the sluice valves, and work is in progress for the connection with the Bridge Street sewer.

*Boston Embankment and Boston Marginal Conduit.*—Work is in progress on the conduit from Otter Street to the Harvard Bridge and at the outlet of the Fens basin. Concrete masonry is being laid for the gate-house and the connection with the marginal conduit, and the coffer-dam is being built around the site of the proposed foot bridge at the outlet of the Fens pond.

*Cambridge Marginal Conduit.*—Work is in progress on the connection of this conduit with the sewers in Binney Street, and the work on the two 48-inch lines of pipe for the siphon under Lechmere Canal is nearly completed.

**METROPOLITAN PARK COMMISSION.**— *Middlesex Fells Parkway.*—Work of construction of extension of Middlesex Fells Parkway to Middlesex Fells Reservation and road-bed for electric railway is in progress.

*Mystic River Reservation.*—The work of constructing boat-lock, dam, tide gate chambers, weirs and sluices at Cradock Bridge, Medford, has been awarded to Coleman Brothers, Contractors, and work is in progress. This work is entirely of reinforced concrete construction.

*General.*—Repairs to roadways throughout the Metropolitan district and the application of various treatments for the preservation of road surfaces and prevention of dust nuisances.

**HARBOR AND LAND COMMISSION.**—The dredging of an enlargement of the anchorage basin for yachts near the steamboat wharf at Nantucket to the depth of 12 feet at mean low water is now in progress.

The dredging of Rock Creek at Orleans with an hydraulic suction dredge is now in progress. The bottom of the channel is being excavated to 2 feet about mean low water and as the crest of the bar at its mouth is about 5 feet above mean low water the dredging will give a depth in the harbor of about 3 feet at low tide. The mean low water contour in the bay is about one statute mile beyond high water line.

The building of a Boat Harbor at Deacons Pond in Falmouth by dredging a basin and protecting its entrance by stone jetties is now in progress.

The work of dredging the Anchorage Basin in Boston Harbor to 30 feet deep at mean low water is still in progress.

The work of dredging a channel 35 feet at mean low water from the Government Channel into the dock of the Cunard Steamship Co. at East Boston is in progress.

The dredging of the Reserved Channel at South Boston is also still in progress, making the channel from 200 to 300 feet wide and 20 feet deep at mean low water.

The improvement of Menemsha inlet at the western end of Martha's Vineyard by building stone jetties and dredging a channel and anchorage basin is still in progress. The jetties are practically finished, and the dredging will be finished very soon.

The improvement of the West Bay entrance at Osterville has just been commenced. This involves the removal of the old westerly timber jetty and the construction of a new western jetty 100 feet further west, making the entrance 200 feet wide and the dredging of the full width of the new addition.

The enlarging of the jetties at Cuttyhunk is now actively in progress.

The work of extending the concrete sea-walls at North Scituate is nearly completed.

**HIGHWAY COMMISSION.**—State highway work is in progress at present in the following municipalities:—

Ashby (concrete bridge at Willard Brook),  
Chelmsford, gravel road,  
Dracut, macadam road,  
Freetown, macadam road,  
Gloucester, macadam road,  
Groton-Pepperell  
(concrete bridge at Nashua River),  
Lee, gravel road,  
Lennox, gravel road,

Palmer, macadam road,  
Plymouth, macadam road,  
Somerville, macadam road,  
Southbridge, brick paving.  
Sterling, macadam road,  
Warren, macadam road,  
Webster, macadam road,  
Winchendon, macadam road.

**Boston Transit Commission.**—It is expected that the Washington-Street Tunnel work which will be in progress about June 15, 1908, will consist mainly of tiling, plastering, painting and other interior finish; enlarging the Subway under the Relief Hospital, and extending the sub-passageway at Traverse Street.

**Boston Elevated Railway.**—*Elevated and Subway Construction, Forest Hills Extension.*—Foundations for the extension of the elevated structure are in progress from the Arborway south to Walk Hill Street. Changes in the surface tracks to their permanent new location are going on to allow for additional foundations.

*Egleston Square Station.*—Reinforced concrete platform and sub-passageway under the platform are under construction, also island platform at the entrance and exist stairways.

*South Approach, Washington-Street Tunnel.*—Reinforced concrete building enclosing the steel structure is being constructed. Repairs and changes to the buildings adjacent are under way.

*East Cambridge Extension, North Approach.*—Foundations for the elevated structure and reinforced concrete walls and inverts for the surface tracks and elevated lines are under construction. The Traverse Street foot passage is being lowered to accommodate the new work; concrete piles are being driven and steel structure for one of the new elevated tracks is being erected.

*Charles River Bridge.*—Concrete is being deposited inside the cofferdams for piers 2, 7 and 8. Piles are being driven in pier 4 and stone masonry being laid in pier 10 of this bridge.

**Boston & Maine Railroad.**—Rebuilding of Greenville Viaduct to replace the wooden structure which burned December, 1907. This is a single track viaduct spanning the Souhegan River Valley at the end of the Greenville Branch of the Fitchburg Division. It consists of 11 spans varying from 27 feet to 67 feet 3 inches carried on 3 steel towers and 4 masonry piers. Length over all 615 feet 3½ inches, top of rail to bed of river 99.2 feet.

**Boston & Albany Railroad.**—*Beacon Park Engine House.*—The construction of the superstructure of a 30 stall engine house, with floors of the same and the superstructure of a power building, between the site of the new engine house and the present engine house, containing a boiler room, fire rooms and coal bins, with brick floors for the power building. The contract has been let to Gerry and Northup, and work will be commenced at once. The foundations for this building are about finished.

*Worcester Grade Crossing Abolition.*—Masonry and street grading and surfacing, sewer and water pipe work necessary for



the abolition of grade crossings at Gardner and Grand Streets, including the construction of a new street, Gates Street extension, which is to pass over the railroad about 500 feet west of Grand Street, also the construction of retaining walls between tracks from Gardner Street, to a point 880 feet east of Gardner Street, and between Gardner and Grand Street. This contract has been let to Ryan & Keon of New Bedford. Work on this contract has commenced on the walls east of Gardner Street.

*Hinsdale, Mass., Third Track.*—Retaining and ditch walls have been commenced at Hinsdale, Mass., in connection with the third track work.

*Milton, Mass. — Blue Hill Observatory.*—The Aberthaw Construction Co. are completing the tower of the new observatory and putting on the finish concrete work.

*Chelsea, Mass.*—The Aberthaw Construction Co. are starting work on two buildings for Samuel Cabot, Inc., of reinforced concrete construction throughout, with pile foundations, metal sash and wire glass.

*Marion, Mass. — Water Works.*—These works are now in process of construction and the portion included in the original plan is nearing completion. The Works when entirely completed will consist of about eleven miles of cast iron water mains from 4 inches to 12 inches in diameter; a pumping station of brick with slate roof; a storehouse nearby also of brick with slate roof; a pumping plant consisting of two 35 h. p. oil engines, two triplex power pumps each having cylinders of  $7\frac{1}{2}$  inches diameter and 8 inches stroke, the pumps being located between the two engines and driven by a shaft directly connected with the shaft of the engine, and so arranged that by means of clutches either engine can be used with either pump or all run together. The lay-out of the pumping machinery is to be similar to that of the Edgartown, Mass. Water Works erected in 1906, where the engines are started with compressed air obtained by water pressure from the stand-pipe. The oil tanks on the engines are filled by the use of compressed air also. The source of the water supply will be a system of driven wells each  $2\frac{1}{2}$  inches in diameter of which there are at present 16. These are connected with the pumps by a suction pipe having flange joints. The water will be pumped through a force main 10 inches and 12 inches in diameter, which passes through the village to a stand-pipe erected on a hill near the village. The stand-pipe is 20 feet in diameter by 100 feet high and will have a balcony and roof. The Works are expected to be in operation sometime during the present month. Mr. Louis E. Hawes is Engineer for the Town.





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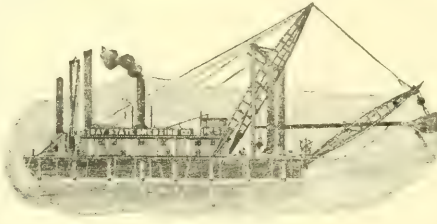
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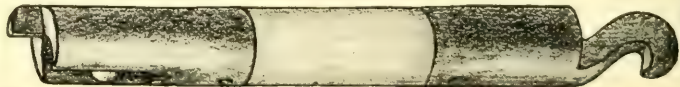
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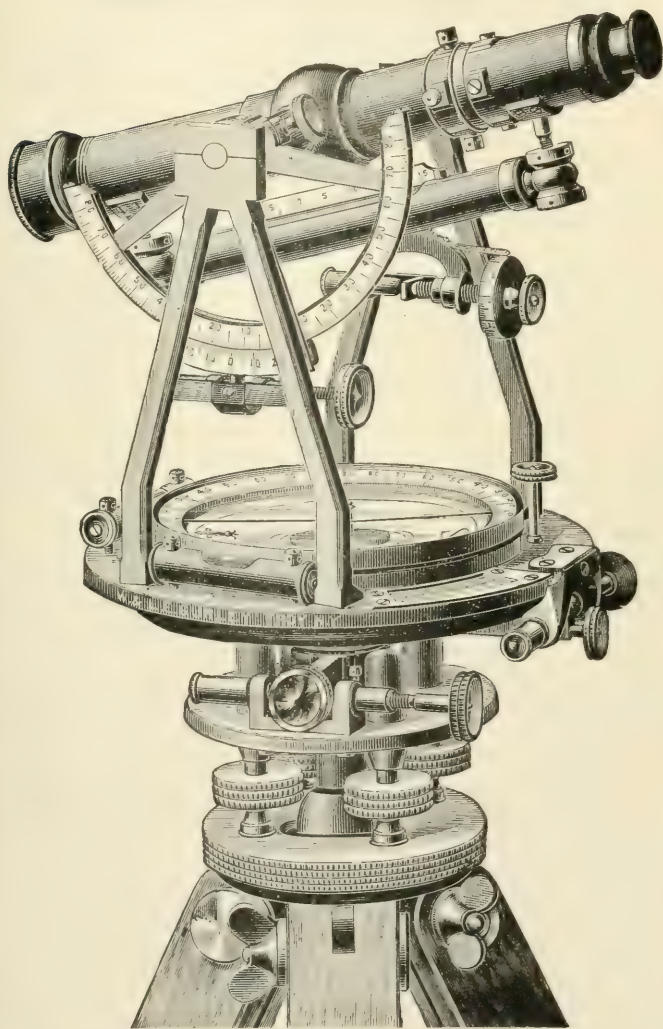
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
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# **BOSTON SOCIETY OF CIVIL ENGINEERS.**

**ORGANIZED JULY 3, 1848.**

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## **MONTHLY BULLETIN.**

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**NEW SERIES.**

**SEPTEMBER, 1908.**

**No. 24.**

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### **REGULAR MEETING.**

A regular meeting of the Boston Society of Civil Engineers will be held on Wednesday, September 16, 1908, at 7.30 P. M., in

**CHIPMAN HALL, TREMONT TEMPLE, BOSTON.**

Mr. Sanford E. Thompson and Mr. Benjamin Fox will present a paper entitled "Notes on Driving Cast Reinforced Concrete Piles." The paper will be illustrated by lantern slides.

Mr. M. M. Cannon, C. E., will give an informal talk describing the construction of the Steamship Terminals at Brunswick, Ga., and the pier at the Navy Yard, Charleston, S. C., with special reference to the concrete piles used in these structures. Lantern slides will be used to illustrate.

**BUSINESS OF THE MEETING:** To ballot on the applications for membership as announced in this notice.

**S. E. TINKHAM, *Secretary.***

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### **EXCURSION.**

There will be an excursion on Wednesday, September 16, to the Charles River Dam. Members will meet at the corner of Charles and Leverett Streets promptly at 2.30 P. M. An opportunity will be given to inspect the operation of the draw-bridge, and the construction of the lock, pump wells, sluice gates and cut-off dam. It is possible that arrangements can also be made to take the party up to inspect work on the Marginal Conduit at the entrance to the Fenway.

**EXCURSION COMMITTEE.**



## CANDIDATES FOR MEMBERSHIP.

To be balloted on at meeting Sept. 16, 1908.

### AS MEMBERS.

JAMES RUMFORD BALDWIN, Woburn, Mass., (b. 1880). Graduated from Winchester, Mass., High School in 1899, and entered the employ of the Solvay Process Co. of Syracuse, N. Y., working mostly on boiler and engine tests; attended Mass. Institute of Technology, 1900-01; entered Harvard University in 1901; during summers of college course, worked as rodman and instrument man for Locks and Canals Co. of Lowell, and for the Essex Co. of Lawrence; graduated from Lawrence Scientific School in 1905; since graduation has worked for A. T. Safford of Lowell and Charles T. Main of Boston on hydraulic investigations and developments; and at present is employed by Locks and Canals Co. of Lowell. Recommended by A. T. Safford, G. M. Mansur, R. A. Hale and C. T. Main.

JOHN VANDERVEER BEEKMAN, JR., Boston, (b. 1874). Graduated from Mass. Institute of Technology in course of structural engineering in 1900. Summer of 1900, draftsman for Levering & Garrigues, New York; 1900 to 1901, designing mill buildings for Edison Portland Cement Co.; 1901 to 1902, with Purdy and Henderson, civil engineers of New York; 1902 to 1904, in charge of Purdy and Henderson's drafting rooms, Boston; and from 1904 to date, manager for Purdy and Henderson. Recommended by G. F. Swain, J. R. Worcester, R. E. Curtis and W. S. Johnson.

ARMAND WILLIAM BENOIT, Lawrence, Mass., (b. 1883). Graduated from Tufts College in 1907 with degree of B.S. in civil engineering. Summer of 1905 was assistant engineer at the plant of the United Shoe Machinery Co., Beverly; summer of 1906 was assistant engineer under Ransome & Smith of New York on extension of same plant; and summer of 1907 had charge of some concrete construction in Lawrence; at present with William Wheeler, C. E., Boston. Recommended by R. S. Weston, William Wheeler, C. W. Sherman and Leonard Metcalf.

HARALD DONALD JONES, Boston, (b. 1883). Civil engineering course at Cornell University, 1902-03. Time keeper, Portland Co., 1904; with Megquier & Jones Co., 1905; with New Jersey Bridge Co. 1906; and drafting and estimating for W. F. Kearns Co., 1907, and at the present time. Recommended by G. H. Brazer, J. R. Worcester, H. W. Fitts and R. G. Hartshorne.

JAMES MANNING McNULTY, Boston, (b. 1881). Graduated from Boston English High School in 1897 and took advanced course in 1898. Entered the Engineering Department, Boston, in 1898 and has been employed there to date, starting as rodman and is now assistant engineer. Recommended by F. A. McInnes, F. I. Winslow, M. T. Cook and S. H. Thorndike.

LUIS GONZAGA MORPHY, Newton, Mass., (b. 1876). Received B. A. degree in Mexico City and B. S. at Spring Hill College, Mobile, Ala., and attended Rensselaer Polytechnic Institute, Troy, two and one-half years. Has been engaged in continuous practice of engineering since Jan., 1900, having successively engaged as assistant supervisor of track, acting supervisor of track, assistant engineer in M. of W. dept.; assistant engi-

neer in construction department; resident engineer and assistant to principal assistant engineer, on the N. Y. C. & H. R. R. R.; then transferred to B. & A. R. R. as assistant engineer of M. of W. and construction and recently appointed assistant to chief engineer of the latter company. Recommended by Walter Shepard, William Parker, W. G. S. Chamberlain and W. C. Whitney.

ALFRED W. PARKER, Waltham, Mass., (b. 1844). Educated in public schools of Boston and Ashburnham. From 1863 to 1868 with J. R. Robinson & Co., steam engineers, making and installing steam power plants in mills throughout New England; 1868 to 1876, superintendent of shops, National Bridge and Iron Works; 1877, laying out and building steel dredge-boat, G. W. R. Bailey, for Capt. J. B. Eads, at Pittsburgh, Pa.; 1878 to 1880, detailing and supervising erection of N. Y. Elevated R. R. (8th, 9th and 2d Avenues), for Clark, Reeves & Co. Phoenixville, Pa.; 1880 to 1895, in charge of template department, Boston Bridge Works (having from two to sixteen assistants); 1895 to 1899, chief inspector of steel work for Boston Transit Commission (six assistants); 1899 to 1902, chief inspector of steel work for Boston Elevated Ry. Co., elevated lines construction in shop and field (twelve assistants); and from 1902 to date, superintendent of steel work for Boston Transit Commission on East Boston Tunnel and Washington St. Tunnel. Recommended by J. R. Worcester, J. P. Snow, G. A. Kimball and S. E. Tinkham.

HENRY BLANCHARD PRATT, Waltham, Mass., (b. 1877). Graduated from Waltham High School in 1895. Engineering Dept., Cambridge, 1895-98; with 5th Regiment, U. S. V., 1898-99; with G. E. Sleeper, C. E., on street railway location, April-July, 1899; and since July, 1899, with J. R. Worcester and J. R. Worcester & Co. At present assistant engineer in charge of Waltham office of J. R. Worcester & Co. Recommended by J. R. Worcester, G. H. Brazer, E. E. Pettie and C. C. Turner.

HARRY EDGAR SAWTELL, Medford, (b. 1872). Educated in Lynn public schools. With E. A. Buss, C. E., Boston, four and one-quarter years; with the Cumberland Co. (a part of S. D. Warren Co.) two and a half years; with the engineering department of the Boston Steel & Iron Co. for three years as draftsman, and for two and a half years as chief draftsman, holding that position when company failed; with engineering department of Boston Elevated Ry. Co. six months; with Dean & Main, engineers, for fourteen months, and with C. T. Main, C. E., from January, 1907, to the present time. His principal work has been structural engineering. Recommended by G. A. Kimball, C. T. Fernald, F. M. Ganby, L. S. Cowles and C. T. Main.

GILBERT SMALL, Boston (b. 1885). Graduate Mass. Inst. of Tech., mechanical engineering. 1907. During summers of 1904 and 1905 was employed by the Draper Co. of Hopedale as an assistant to H. S. Dunn of the building department; summer of 1906, as draftsman for J. R. Worcester, C. E., and since June, 1907, with J. R. Worcester & Co. Recommended by J. R. Worcester, G. H. Brazer, E. E. Pettie and Galtano Lanza.

## APPLICATIONS FOR MEMBERSHIP.

The following applications for membership have been received and are now before the Board of Government for approval. Members having information which will assist the government in its consideration of these applications are requested to communicate at once with any member of the Board. Communications will be regarded as confidential and for the use of the Board alone.

### AS MEMBERS.

EDWARD EVERETT ALBEE, Melrose, Mass., (b. 1877). At Mass. Institute of Technology, three years with class of 1899, civil engineering course. Summer of 1897 with town of Melrose on sewer construction; from August, 1898, to March, 1902, with Boston Elevated Ry. Co., department of elevated construction; from March to November, 1902, with James F. Shaw & Co., on construction of Boston & Worcester and Waltham Street Railways; from November, 1902, to June, 1904, with E. P. Adams, C. E.; and from June, 1904, to date, with Boston Elevated Ry. Co., elevated and subway construction, as assistant engineer. Recommended by E. P. Adams, G. A. Kimball, E. R. Olin, L. S. Cowles and C. T. Fernald.

HERMON RICHARD BLISS, Providence, R. I., (b. 1871). Graduate of Providence High School, also was taught by G. C. Anthony of R. I. Tech. Drawing School. Assistant engineer in City Engineer's office, Providence, 1889 to 1900, the last seven years being devoted to bridge construction, including foundation work and steel superstructures under W. D. Bullock; from 1900 to present time, with J. H. Tower, Providence, as designing engineer for structural steel and ornamental iron for buildings. Recommended by O. F. Clapp, W. D. Bullock, E. M. Ross and I. S. Wood.

ALVIN WARD KING, Newton, Mass., (b. 1885). Entered Cornell University September, 1903, and graduated June, 1907, with C. E. degree. During summer of 1905 employed in the asphalt and cement testing laboratories of the District of Columbia; from July, 1907, to June, 1908, with Stone & Webster of Boston; and since June, 1908, in the office of the city engineer of Newton. Recommended by I. T. Farnham, W. P. Morse, I. W. Hastings and H. G. Harrison.

CHARLES HENRY PEASE, Boston, (b. 1875). Graduate of Mass. Institute of Technology in mechanical engineering in 1898. Draftsman with B. F. Sturtevant Co., 1898; draftsman, U. S. Navy Yard, New York, equipment department, 1898-99; draftsman, Baldwin Locomotive Works, Philadelphia, 1899; draftsman with E. D. Leavitt, 1899; draftsman, Edison Electric Illuminating Co., Boston, 1900 to 1902; March, 1902, entered firm forming partnership of Eastman, Pease & Co., contracting engineers in iron and steel construction, 12 Pearl St., Boston; firm dissolved Jan. 12, 1908, and at present he is engaged in same business at 7 Water St., Boston, under firm name of C. H. Pease & Co. Recommended by F. L. Fuller, F. L. Murray, F. B. Dowst and R. E. Curtis.

RALPH EMERSON RICE, Boston, (b. 1883). Graduated from Roxbury High School 1902-03, having completed a four years' college preparatory course. March to October, 1903, was employed by the C. H. W. Wood Co.,

Roxbury, civil engineers and surveyors, on office and outside work; October, 1903, to March, 1906, was employed by Metropolitan Park Commission, first as rodman and later as instrument man; and since March, 1906, employed by the Boston Elevated Ry. Co., as instrument man, and now holds position as assistant in the computation department. Recommended by G. A. Kimball, C. T. Fernald, J. R. Rablin, W. C. Ewing and E. R. Olin.

RALPH BARTON SAUNDERS, Boston, (b. 1884). Graduated from Lowell High School 1903, and attended Mass. Institute of Technology the following two years. Employed summers by Mr. George Bowers, City Engineer, Lowell; from October, 1906, to March, 1907, with Surface Line Department, Boston Elevated Ry. Co.; from March, 1907, to the present time with the Elevated Division of Boston Elevated Ry. Co. Recommended by E. R. Kimball, H. C. Hartwell, E. R. Olin and L. S. Cowles.

ALBERT TILDEN SPRAGUE, JR., Revere, Mass., (b. 1870). Graduated from Derby Academy, Hingham, in 1888. Worked with C. W. Howland, C. E., Rockland, Mass., for four years; In 1892 and 1893 was employed as transitman, Brockton Sewerage System; In 1894 was employed as assistant to City Engineer of Marlboro', on reservoir and water supply; in 1895 employed as assistant by White & Wetherbee, civil engineers, Brockton and Braintree; 1896 entered employ of B. & M. R. R. as assistant engineer, and in 1899 entered bridge department and was bridge inspector until spring of 1906; in 1906 entered the employ of the Boston Elevated Ry. Co. as steel inspector, and is at present with that company in charge of maintenance of the elevated structure and changes for eight car platforms. Recommended by W. H. Norris, J. P. Snow, H. C. Hartwell and L. S. Cowles.

HERMAN FRANKLIN TUCKER, Culebra, Canal Zone, Panama, (b. 1878). Graduated from Harvard University, Engineering Department, degree of S. B., in June, 1901. During vacations and for five years after graduation was in the employ of J. R. Worcester, C. E.; was connected with Harvard Stadium as engineer in charge under Prof. Johnson; five weeks assistant instructor in Harvard Engineering Summer School at Squam Lake, N. H.; from June, 1906, to February, 1907, employed as head of engineering department of Dominion Engineering and Construction Co., Montreal, P. Q., designing many large reinforced concrete buildings; from February to June, 1907, assistant engineer, Isthmian Canal Commission at Washington, and since June, 1907, Designing Engineer, I. C. C., Culebra, C. Z., Panama. Recommended by J. R. Worcester, L. J. Johnson, E. E. Pettée and G. H. Brazier.

GEORGE STANLEY WHITEHEAD, Cambridge, (b. 1874). Educated in public schools of Medford. With E. W. Bowditch, C. E., as rodman, about a year and a half; with Hodges & Harrington, civil engineers, as draftsman, about six months; with L. M. Hastings, City Engineer, Cambridge, as draftsman on Hobbs Brook Water Supply, from May 25, 1894, to September 1, 1899; with Metropolitan Water Board as draftsman, from September 1, 1899, to March 16, 1903; with A. H. French, Town Engineer, Brookline, from March 16, 1903, to the present time, drafting and field work. Recommended by A. H. French, L. M. Hastings, C. J. Wallace and F. H. Carter.



## MINUTES OF MEETINGS.

Boston, JUNE 17, 1908. — At the hour named in the call for the regular meeting this evening a quorum not being present, the meeting was not called to order.

S. E. TINKHAM,  
*Secretary.*

BRETON WOODS, N. H., JULY 4, 1908. — A special meeting of the Society was held at the Mount Pleasant House. President J. R. Worcester in the chair; twenty-five members and guests present.

In the absence of the Secretary, Mr. Irving T. Farnham was appointed Secretary *pro tem.*

The subject for discussion was, "Why do not Engineers take a more prominent part in public affairs." The President made the opening address and introduced the following speakers:— Mr. George B. Francis, Past President Dexter Brackett, Mr. Morris Knowles and Past Presidents Frank W. Hodgden and William E. McClintock. After a few closing remarks by the President, the meeting adjourned.

IRVING T. FARNHAM,  
*Secretary pro tem.*

[The address will be printed in an early number of the Journal of the Association of Engineering Societies.]

### LIST OF MEMBERS.

#### ADDITIONS.

MAURICE F. BROWN, Ch. Engr. Boston Bridge Works, 47 Winter St., Boston.  
FREDERICK W. HUNTINGTON (Sanitary Section), 134 Austin St.,  
Cambridge, Mass.  
ERNEST M. TREFETHEN . . . City Engineer's office, Lynn, Mass.

#### CHANGES OF ADDRESS.

T. T. ALLARD, Ch. Engr. with Champion & Pascual, 101 Obispo St.,  
Havana, Cuba.  
W. H. BALCH . . . . . Monte Cristi, Santo Domingo.  
W. E. BUCK . . . . . 31 Institute Road, Worcester, Mass.  
G. P. FROST . . . . . Camp No. 9, U. S. R. S., Naches, Wash.  
H. V. MACKSEY . . . . . Middleport, N. Y.  
L. F. PATSTONE . . . . . 45 Nisbet St., Providence, R. I.  
P. E. PETTEE . . . . . 218 Columbus Ave., Boston.  
W. V. POLLEYS . . . . . Ridge, St. Mary's Co., Md.  
SIDNEY SMITH . . . . . 3000 Virginia Ave., Louisville, Ky.  
G. E. SLEEPER . . . . . 28 So. 17th St., East Orange, N. J.  
A. T. TOMLINSON . 502 Lansdowne Ave., Westmount, Quebec, Canada.  
E. D. TREADWELL . . . . . Northfield, Vt.

# LIBRARY NOTES.

## RECENT ADDITIONS TO THE LIBRARY.

### United States Government Reports.

War Department, Annual Report, Chief of Engineers, 1907.  
 Commissioner of Education, Annual Report for 1906.  
 Chief of Weather Bureau, Annual Report for 1907.

### State Reports.

Massachusetts Railroad Commissioners, Annual Report, 1907.  
 Massachusetts Harbor and Land Commissioners, Town  
 Boundary Lines; Berlin, Bolton, etc.  
 New Jersey, Annual Report of State Geologist, 1906.  
 New Jersey, Annual Report of State Geologist, 1907.  
 Rhode Island, Public Health Laws.  
 Rhode Island, Annual Report, Commissioner of Dams and  
 Reservoirs, 1907.

### City and Town Reports.

Somerville, Mass., Annual City Report, 1907.  
 New York City, Annual Report of Board of Water Supply,  
 1906.  
 Baltimore, Md., Annual Report of Water Board, 1907.  
 Salem, Mass., Annual Report of Water Board, 1907.  
 Cambridge, Mass., Annual Report of Water Board, 1907.  
 Hartford, Conn., Annual Report of Water Dept., 1907.  
 Springfield, Mass., Annual Report of City Engineer, 1907.  
 Melrose, Mass., Annual Report, Public Works Dept., 1907.  
 Holyoke, Mass., Annual Report, City Engineer, 1907.  
 Newton, Mass., Annual Report, City Engineer, 1907.  
 Lowell, Mass., Annual Report, Water Board, 1907.  
 Lynn, Mass., Board of Public Works, 1907.  
 Erie, Penn., Annual Report, Water Works Commissioners,  
 1907.  
 Albany, N. Y., Annual Report of Water Bureau, 1907.  
 Newark, N. J., Annual Report, Board of Street and Water Com-  
 missioners, 1907.  
 Lewiston, Me., Annual Report of Water Board, 1907.

### Miscellaneous.

Four-place Logarithms, E. Saxton. (Gift of Author)  
 Electrical Engineers Hand-Book, H. A. Foster. (Fifth Edition)  
 Springfield, Mass., Report on Little River Water Supply.

Mixed Paints, Color Pigments and Varnishes: C. D. Holley and E. F. Ladd.

Development and Electrical Distribution of Water Power: Lyndon Lamar.

Elements of Water Bacteriology: S. C. Prescott and C. E. A. Winslow.

Engineering Reminiscences: Chas. T. Porter. Gift of Clemens Herschel.

Recollections of an Ill-Fated Expedition: N. B. Craig. Gift of Clemens Herschel.

Croton Aqueduct and Reservoirs, Description and Sketch—1907.

During the past summer the book shelves have been cleaned by the vacuum process, and the books are now reasonably clean.

A plan case has been bought for the United States topographical sheets, rendering these plans accessible.

FREDERIC I. WINSLOW, *Librarian*.

## NEW ENGINEERING WORK.

(Under this head the Excursion Committee proposes to present each month a brief résumé of engineering work in progress in New England, as far as such information is readily obtainable. The assistance of members is desired, and items of interest will be gladly received. Such items are intended to include not only works of exceptional magnitude or containing novel features, but also engineering construction work of all kinds and all degrees of magnitude. Notes should be in the hands of the Committee not later than the 2nd Wednesday of each month. The thanks of the Committee are due to the members who have furnished data for the Bulletin.—E. M. BLAKE, Secretary, Excursion Committee, 8 Beacon St., Boston.)

**United States Government.**—CAPE COD PILGRIM MONUMENT, PROVINCETOWN, MASS.—The construction of the stone tower 250 feet high is in progress under contract, and the tower has now reached the height of about 65 feet.

BREAKWATER AT HARBOR OF REFUGE, SANDY BAY, CAPE ANN, MASS.—Contract was made May 9, 1908 for the construction of 400 feet, more or less, of the superstructure of the breakwater and work has been in progress under this contract since early in June. The superstructure begins at 12 feet below mean low water, requiring the laying of heavy dimension stones by diver, and for a portion of the length under contract has reached a height of 13 feet above low water.

AT GROVERS CLIFF, WINTHROP, MASS.—Proposals have been received and contract will shortly be entered into for the construction of riprap sea wall for the further protection of the shore

from erosion by the sea in extension of 300 feet of similar protection placed during the season of 1907.

**BEVERLY HARBOR, MASS.**—Bids have been invited and contract will be shortly entered into for removal of 581 cubic yards of submarine ledge in the channel of this harbor.

**DORCHESTER BAY AND NEPONSET RIVER, MASS.**—Contract was entered into May 13, 1908 with Charles M. Cole, of Fall River, for dredging about 455,000 cubic yards at 17 cents per cubic yard.

**SURVEYS**, plans and estimates are in progress of preparation for determining the advisability of constructing a lock and dam in the Merrimac River to provide 14 feet of water at Haverhill, and of constructing a breakwater to protect the anchorage in the Cow Yard in Plymouth Harbor.

**Commonwealth of Massachusetts.**—**CHARLES RIVER BASIN COMMISSION.**—*Work in Progress at the Dam and Lock.*—The Lock was opened to navigation on Tuesday, September 1. The Scherzer rolling lift bridge is in operation and the lock-gates and pumps for emptying the Lock are in working order. The houses over the operating machinery for the lock-gates are in process of erection. The shut-off dam is partly constructed entirely across the river. The work of placing riprap to prevent scouring is under way.

**AT THE SLUICES.**—The switchboards for operating the large sluice-gates are in place and all of these gates can be operated at any time.

**BOSTON EMBANKMENT AND BOSTON MARGINAL CONDUIT.**—The marginal conduit is practically completed from the downstream face of the Dam to within a few hundred feet of Hereford Street, except for two small gaps of perhaps one or two hundred feet each. The concrete masonry for the gate-house at the outlets of the Fens is well under way, and the masonry for the Fens pond bridge is now being laid.

**CAMBRIDGE MARGINAL CONDUIT.**—This conduit has been completed from Binney Street to the north side of Lechmere Canal, and the remaining 200 feet is now under construction.

**HARBOR AND LAND COMMISSION.**—The following pieces of work are now actually in construction.

(1) The construction of stone jetties and excavating a basin at Deacon's Pond in the town of Falmouth, for a boat harbor.

(2) The construction of two stone jetties at Cuttyhunk harbor to protect the entrance to the harbor and direct the current so that it will scour a channel across the bar.



(3) The extension of a stone breakwater in Vineyard Haven harbor. (This work is now nearly completed.)

(4) The construction of an earthen dike, with timber core wall and sluices for diking out the sea and draining about 1,100 acres of salt marsh at Herring River, Wellfleet, primarily for the purpose of preventing the breeding of mosquitos, and secondarily to create tillage land from the salt marsh.

(5) The construction of a stone jetty and the widening of the entrance to West Bay in the village of Osterville in Barnstable.

(6) The dredging of the entrance and a channel within the harbor of East Bay at Osterville in Barnstable.

(7) The protection of the bank of the Connecticut River in Hadley by placing stone riprap below the ordinary summer level of the river.

(8) The dredging of the Reserved Channel in South Boston to a depth of 20 feet, mean low water. (This work is also nearly completed.)

(9) The dredging of the anchorage Basin at Bird Island in Boston harbor. All the area has now been dredged over, but some shoals that remain must be removed before the whole area is excavated to the depth of 30 feet at mean low water.

In addition to the above work contracts have been let and work will shortly begin on the following projects:

(1) The dredging of the channel and anchorage basin in West Falmouth harbor.

(2) The construction of an oak pile wharf at Penikese Island, the leper colony.

(3) The enlargement of the anchorage basin near Savin Hill in Dorchester Bay.

(4) The dredging of an anchorage basin in Winthrop harbor near the club-house of the Winthrop Yacht Club.

Bids are to be received on September 4th for the dredging of about 700,000 cubic yards in Plymouth harbor, to form a channel from the Cow Yard to the wharf of the Plymouth Cordage Company, and bids are to be received on September 11th for the dredging of some shoals in Weymouth Fore River, near Braintree Bridge, and also for enlarging the anchorage basin in Rockport harbor by the removal of boulders.

METROPOLITAN WATER AND SEWERAGE BOARD, WATER WORKS.—No construction work is in progress at the present time.

Work will be commenced about the middle of September on contract for laying 12,400 linear feet of 48-inch pipe in Beacon

Street and Longwood Avenue, Brookline and Boston for the purpose of improving the supply in the low service district of the city of Boston.

**SEWERAGE WORKS.**—Construction on extension of the South Metropolitan System is in progress in Brookline and Brighton. The work consists of sewers ranging in diameter from six feet to seven feet, in open cut and in deep rock tunnel.

**METROPOLITAN PARK COMMISSION.**—*Middlesex Fells Reservation.*—Work of construction of reinforced concrete bridge of 3 arch spans for electric railway at Brooks Road is in progress.

Portions of roadway known as Woodland Road is being resurfaced with a combination of macadam base and gravel surface, heavy asphalt oil being used and incorporated with the gravel used in the surfacing.

*Mystic River Reservation.*—Work of construction of dam, weirs, tide gates, etc., at Cradock Bridge is in progress.

*Mystic Valley Parkway.*—The work of construction of reinforced concrete bridge over Alewife Brook is in progress.

*Middlesex Fells Parkway.*—Portions of macadam roadways are being resurfaced, tar being used and incorporated with the surfacing material to form a type of tar macadam.

**HIGHWAY COMMISSION.**—State highways are now under construction in the following cities and towns:—

Adams,	Granby,	Rehoboth,
Boston,	Harwich,	Sharon,
(Washington St., W.	Ipswich,	Somerville,
Roxbury)	Littleton,	Templeton,
Bridgewater,	Methuen,	Wareham,
Canton,	Middleboro,	Wilmington,
Chatham,	Monson,	Windsor.
Deerfield,	Montague,	
Duxbury,	No. Andover,	BRIDGES.
Freetown,	No. Brookfield,	Ashby,
Gardner,	Orleans,	Groton-Pepperell,
Goshen,	Palmer,	(removing frame)
Greenfield,		Leicester.

**Boston Transit Commission.**—It is expected that the Washington street Tunnel work in progress about September 15, 1908, will consist mainly of making the changes in the old Subway in Haymarket Square and under the Relief Hospital, installing stair balustrades and hand-rails, plastering and painting in the various stations.

**Boston Elevated Railway.**—**ELEVATED AND SUBWAY CONSTRUCTION.**—*Forest Hills Extension.*—Erection of steel for Forest Hills Extension is in progress at the Arborway, the steel

being erected up to the northerly end of the proposed new station. The elevated structure is designed for a one post structure crossing the Arborway, post being approximately 11 ft. in diameter, octagonal in shape.

*South Approach, Washington St. Tunnel.*—The masonry incline is substantially completed; the train floor is protected with a facing of brickwork laid in Hydrex compound and the work is being made ready to receive the track which will probably be laid within the next week or ten days.

*North Approach, Washington Street Tunnel.*—The steel-work for the south bound East Cambridge track has been erected and a portion of the track is in place. Work of erecting temporary trestle for a crossover from the present south bound elevated track to this south bound East Cambridge track is under way and within a few weeks trains will be turned over this track and the present south bound elevated removed and a new structure built in its place.

*East Cambridge Extension, Charles River Bridge.*—Stonework on four of the piers is up above high water mark and the foundations are ready for the stonework on two other piers. As soon as conditions will permit work will be begun on pier 5, which will be the last of the river piers to be built.

**Boston & Maine Railroad.**—A steel deck bridge of four spans is to be built over the Cocheco River at Dover, N. H., replacing the three span wooden Howe truss bridge which was built in 1872. There will be two plate girder spans 42'-0" center to center bearing, and two riveted truss spans of 144'-4" center to center and 84'-6" center to center bearing.

Work has been started on the elimination of Somerville Avenue grade crossing at Somerville, Mass. The highway which is 63'-0" wide is to be carried over four tracks of the Fitchburg Division of the Boston & Maine, and two tracks of the Boston & Albany. The piers, abutments and retaining walls are to be of concrete on pile foundation.

**New York, New Haven & Hartford Railroad.**—*Hyle Park, Mass.*:—Building concrete retaining walls, abutments for two bridges, concrete arch 70-ft. span over Neponset River, and lowering tracks for the abolition of Fairmount Avenue and Bridge Street grade crossings.

*Worcester, Mass.*:—Building retaining walls, concrete abutments for bridge, 50-ft. arch and passenger subway for the abolition of the grade crossings at Southgate and Cambridge Streets.

*New Bedford, Mass.*:—The work of abolishing nine (9) highway crossings and improving the engine house and freight yard facilities is practically completed.

**Boston & Albany Railroad.**—WORK IN PROGRESS.

Beacon Park Engine House, Allston, Mass.  
Abolition of Grades, West of Hammond St., Worcester, Mass.  
Coal Pocket and Culvert at Salt Creek, Allston, Mass.  
Third Tracking, Jamesville to Webster Junction, Mass.  
North Adams Junction Engine House, Mass.  
Extension of Culverts, Washington to Hinsdale, Mass.  
Bridges 161 & 162, Hinsdale & Dalton, Mass.  
Coal Pocket at Riverside, Mass.

WORK CONTEMPLATED.

New Freight House, Binney St., Cambridge, Mass.  
New Piers and Elevator, E. Boaton, Mass.  
Ash Pits, Beacon Park, Allston, Mass.  
New Passenger Station, Worcester, Mass.  
Tower 9, Natick, Mass.  
New Engine House, West Springfield, Mass.  
Reinforcing Bridges 137 and 139, Middlefield, Mass.  
Bridge 196 new abutment and 197 extension of, E. Chatham, New York.

**Springfield, Mass.**,—*Provin Mountain Reservoir Contract No. 3.*—A covered concrete reservoir covering 92,000 square feet, 26 feet deep. Contract let June 18, 1908 to the Ficklen-Baker Construction Company, (name now legally changed to Baker Contracting Company,) New York, N. Y. Work on this contract well started. Completion of this Contract October 1, 1909.

*Pipeline, Contract No. 4.*—Now advertising for bids. This is twelve miles of 42" pipe to be either steel, wrought iron, or cast iron. Bids to be opened September 9, 1908. Furnishing and laying.

*Intake Dam and Tunnell, Contract No. 1.*—The Culin-Pace Construction Company, New York, who took Contract No. 1 were ordered to discontinue work by the City on August 20th, and the contract has been relet on the same terms on behalf of the Bonding Company to F. T. Ley & Company, of Springfield, Mass.

*Filters and Sedimentation Basin, Contract No. 2.*—The Charles R. Gow Company, Boston, Mass. awarded this contract. This covers six one-half acre filters and sedimentation basin. Work well advanced. One filter substantially completed.



**Portland, Me.**—The Aberthaw Construction Company, is building for J. P. Baxter, a six story office and store building on Congress Street, nearly opposite the Lafayette Hotel. The building will have brick walls which will be carried upon the concrete frame. It is a good type of fireproof building, and embraces most of the features met with in this type of construction.

**Chelsea, Mass.**,—The Aberthaw Company has just finished the rebuilding of the Samuel Cabot plant. The work includes a wall and reinforced concrete buildings along the entire front of the lot, and back of these other buildings of lighter construction. No attempt has been made toward exterior finish but the type is of standard reinforced mill construction.

**Bellows Falls, Vt.**,—The Aberthaw Company is building the concrete dam across the Connecticut River, immediately below the existing crib dam. This is solid concrete and the only features out of ordinary are the handling of some fairly bad water conditions.

**Everett, Mass.**,—The Aberthaw Company is building in Everett Square, a two story reinforced concrete store and office building. The work has the usual features of this type of construction. It is built with the idea of future stories and a false wooden roof is to be built over what will at some future time be the 3rd. floor of the building.

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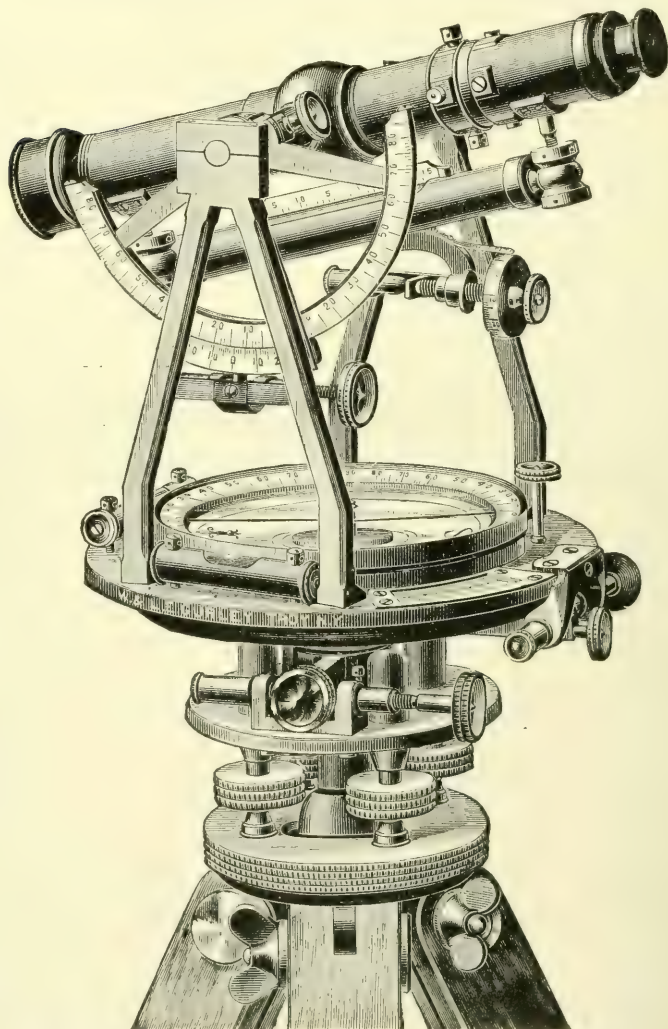
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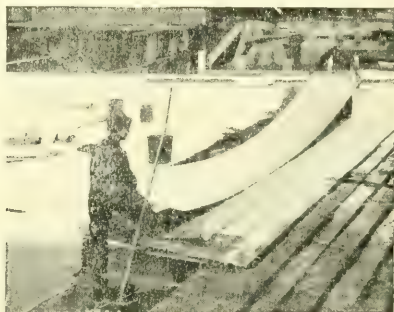


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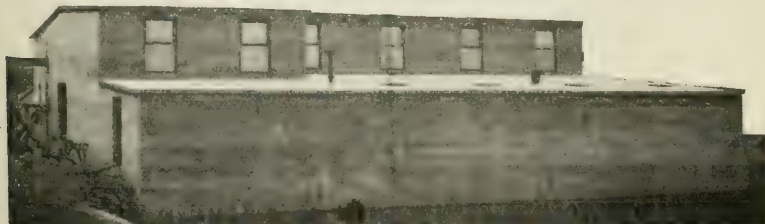
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**T**HE color of **GENUINE ROSENDALE CEMENT** is a dark, rich brown, rendering it easily distinguishable and affording the architect and engineer a safeguard against the use of any other cement in work where genuine Rosendale is specified.

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# BOSTON SOCIETY OF CIVIL ENGINEERS.

ORGANIZED JULY 3, 1848.

## MONTHLY BULLETIN.

NEW SERIES.

OCTOBER, 1908.

No. 25.

### REGULAR MEETING.

A regular meeting of the Boston Society of Civil Engineers will be held on Wednesday, October 21, 1908, at 7.30 p. m., in  
CHIPMAN HALL, TREMONT TEMPLE, BOSTON.

Dr. Edward V. Huntington, Professor of Mathematics at Harvard University, will read a paper entitled, "A Study of the Motion of the Gyroscope, with special reference to the Brennan Mono-Rail Car."

**BUSINESS OF THE MEETING:** To ballot on the applications for membership as announced in this notice.

It is expected that the Committee on Larger Membership and Clubhouse will present its report.

S. E. TINKHAM, *Secretary*.

### EXCURSION.

Through the courtesy of Penal Commissioner Vernon V. Skinner an excursion has been arranged to Deer Island for Wednesday, Oct. 21, 1908. The steamer "Monitor" will leave the city wharf at Eastern Avenue, opposite Fleet Street, and near the South Ferry at 2.15 p. m.

There has just been completed at Deer Island between the United States and City property a \$50,000 reinforced concrete wall. There is in process of construction an earth bank, concrete lined reservoir which is being built by prison labor, and also a large piggery with granolithic floors. If time permits, a visit will be made through the buildings of the Institution.

The Metropolitan Sewerage Board is also building an engine house addition, this work being near at hand.

In returning the steamer reaches the wharf at Boston at about 5.15 p. m. Members are requested to wear badges.

EXCURSION COMMITTEE.



## CANDIDATES FOR MEMBERSHIP.

To be balloted on at meeting Oct. 21, 1908.

## AS MEMBERS.

EDWARD EVERETT ALBEE, Melrose, Mass., (b. 1877). At Mass. Institute of Technology, three years with class of 1899, civil engineering course. Summer of 1897 with town of Melrose on sewer construction; from August, 1898, to March, 1902, with Boston Elevated Ry. Co., department of elevated construction; from March to November, 1902, with James F. Shaw & Co., on construction of Boston & Worcester and Waltham Street Railways; from November, 1902, to June, 1904, with E. P. Adams, C. E.; and from June, 1904, to date, with Boston Elevated Ry. Co., elevated and subway construction, as assistant engineer. Recommended by E. P. Adams, G. A. Kimball, E. R. Olin, L. S. Cowles and C. T. Fernald.

HERMON RICHARD BLISS, Providence, R. I., (b. 1871). Graduate of Providence High School, also was taught by G. C. Anthony of R. I. Tech. Drawing School. Assistant engineer in City Engineer's office, Providence, 1889 to 1900, the last seven years being devoted to bridge construction, including foundation work and steel superstructures under W. D. Bullock; from 1900 to present time, with J. H. Tower, Providence, as designing engineer for structural steel and ornamental iron for buildings. Recommended by O. F. Clapp, W. D. Bullock, E. M. Ross and I. S. Wood.

ALVIN WARD KING, Newton, Mass., (b. 1885). Entered Cornell University September, 1903, and graduated June, 1907, with C. E. degree. During summer of 1905 employed in the asphalt and cement testing laboratories of the District of Columbia; from July, 1907, to June, 1908, with Stone & Webster of Boston; and since June, 1908, in the office of the city engineer of Newton. Recommended by I. T. Farnham, W. P. Morse, I. W. Hastings and H. G. Harrison.

CHARLES HENRY PEASE, Boston, (b. 1875). Graduate of Mass. Institute of Technology in mechanical engineering in 1898. Draftsman with B. F. Sturtevant Co., 1898; draftsman, U. S. Navy Yard, New York, equipment department, 1898-99; draftsman, Baldwin Locomotive Works, Philadelphia, 1899; draftsman with E. D. Leavitt, 1899; draftsman, Edison Electric Illuminating Co., Boston, 1900 to 1902; March, 1902, entered firm forming partnership of Eastman, Pease & Co., contracting engineers in iron and steel construction, 12 Pearl St., Boston; firm dissolved Jan. 12, 1908, and at present he is engaged in same business at 7 Water St., Boston, under firm name of C. H. Pease & Co. Recommended by F. L. Fuller, F. L. Murray, F. B. Dowst and R. E. Curtis.

RALPH EMERSON RICE, Boston, (b. 1883). Graduated from Roxbury High School 1902-03, having completed a four years' college preparatory course. March to October, 1903, was employed by the C. H. W. Wood Co., Roxbury, civil engineers and surveyors, on office and outside work; October, 1903, to March, 1906, was employed by Metropolitan Park Commission, first as rodman and later as instrument man; and since March,

1906, employed by the Boston Elevated Ry. Co., as instrument man, and now holds position as assistant in the computation department. Recommended by G. A. Kimball, C. T. Fernald, J. R. Rablin, W. C. Ewing and E. R. Olin.

RALPH BARTON SAUNDERS, Boston, (b. 1884). Graduated from Lowell High School 1903, and attended Mass. Institute of Technology the following two years. Employed summers by Mr. George Bowers, City Engineer, Lowell; from October, 1906, to March, 1907, with Surface Line Department, Boston Elevated Ry. Co.; from March, 1907, to the present time with the Elevated Division of Boston Elevated Ry. Co. Recommended by E. R. Kimball, H. C. Hartwell, E. R. Olin and L. S. Cowles.

ALBERT TILDEN SPRAGUE, JR., Revere, Mass., (b. 1870). Graduated from Derby Academy, Hingham, in 1888. Worked with C. W. Howland, C. E., Rockland, Mass., for four years; In 1892 and 1893 was employed as transitman, Brockton Sewerage System; In 1894 was employed as assistant to City Engineer of Marlboro', on reservoir and water supply; in 1895 employed as assistant by White & Wetherbee, civil engineers, Brockton and Braintree; 1896 entered employ of B. & M. R. R. as assistant engineer, and in 1899 entered bridge department and was bridge inspector until spring of 1906; in 1906 entered the employ of the Boston Elevated Ry. Co. as steel inspector, and is at present with that company in charge of maintenance of the elevated structure and changes for eight car platforms. Recommended by W. H. Norris, J. P. Snow, H. C. Hartwell and L. S. Cowles.

HERMAN FRANKLIN TUCKER, Culebra, Canal Zone, Panama, (b. 1878). Graduated from Harvard University, Engineering Department, degree of S. B., in June, 1901. During vacations and for five years after graduation was in the employ of J. R. Worcester, C. E.; was connected with Harvard Stadium as engineer in charge under Prof. Johnson; five weeks assistant instructor in Harvard Engineering Summer School at Squam Lake, N. H.; from June, 1906, to February, 1907, employed as head of engineering department of Dominion Engineering and Construction Co., Montreal, P. Q., designing many large reinforced concrete buildings; from February to June, 1907, assistant engineer, Isthmian Canal Commission at Washington, and since June, 1907, Designing Engineer, I. C. C., Culebra, C. Z., Panama. Recommended by J. R. Worcester, L. J. Johnson, E. E. Pettee and G. H. Brazier.

GEORGE STANLEY WHITEHEAD, Cambridge, (b. 1874). Educated in public schools of Medford. With E. W. Bowditch, C. E., as rodman, about a year and a half; with Hodges & Harrington, civil engineers, as draftsman, about six months; with L. M. Hastings, City Engineer, Cambridge, as draftsman on Hobbs Brook Water Supply, from May 25, 1894, to September 1, 1899; with Metropolitan Water Board as draftsman, from September 1, 1899, to March 16, 1903; with A. H. French, Town Engineer, Brookline, from March 16, 1903, to the present time, drafting and field work. Recommended by A. H. French, L. M. Hastings, C. J. Wallace and F. H. Carter.

## MEETINGS OF THE BOSTON SECTION, AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS.

A meeting of the Boston Section of the American Institute of Electrical Engineers will be held on Wednesday evening, Oct. 21, 1908, at 8 o'clock, in the Auditorium of the Edison Electric Illuminating Company of Boston. This room is on the third floor of the new Edison Building, at 39 Boylston Street Boston, between Tremont and Washington Streets.

Mr. Charles M. Allen, Professor of Experimental Engineering at the Worcester Polytechnic Institute, will present a paper on "Field Testing of Water Wheels by Dynamometers," illustrated by lantern slides.

A cordial invitation is extended to the members of the Boston Society of Civil Engineers to attend this meeting.

### APPLICATIONS FOR MEMBERSHIP.

The following applications for membership have been received and are now before the Board of Government for approval. Members having information which will assist the government in its consideration of these applications are requested to communicate at once with any member of the Board. Communications will be regarded as confidential and for the use of the Board alone.

#### AS MEMBERS.

**EDWIN FRANCIS ALLBRIGHT**, Milton, Mass., (b. 1881). Graduate Mass. Inst. Technology in civil engineering class of 1904. With the Southern Railway in the Bridge Dept. from August, 1904, to August, 1908, the last two years as assistant engineer, and at present with J. R. Worcester & Co., Boston. Recommended by G. H. Brazer, J. R. Worcester, E. E. Pettee and F. L. Murray.

**HENRY MASON CHADWICK**, Malden, Mass., (b. 1871). At Mass. Inst. of Technology, September, 1889, to June, 1890. September, 1890, to April, 1892, with Child Acme Cutter & Press Co., Boston, as timekeeper and draftsman on paper cutting machines; April, 1892, to September, 1894, draftsman, Boston Bridge Works; September, 1894, to April, 1895, draftsman, Berlin Iron Bridge Co.; April, 1895, to January, 1896, draftsman and checker, Boston Bridge Works; January, 1896, to September, 1900, with Boston Bridge Works in various capacities, draftsman, checker, foreman of assembling gangs and riveting gang and squad foreman in drafting room; September, 1900, to April, 1901, checker for New England Structural Co.; and April, 1901, to date with Boston Bridge Works, in drafting room, supervising structural details of bridges, buildings and other structures, designing and detailing travelers and falsework for erection and in direct charge of machinery details for drawbridges. At present assistant engineer of construction. Recommended by J. C. Moses, J. R. Worcester, J. P. Snow and M. F. Brown.

JOHN EARL CUNNINGHAM, Kingston, Mass., (b. 1882). Summer, 1902, rodman with Baltimore & Ohio R. R.; June to October, 1904, material man and inspector on construction of electric railway between Alton and East St. Louis, Ill. (J. G. White & Co.); October, 1904, to January, 1905, concrete inspector for Illinois Terminal R. R.; January, 1905, to January, 1906, with Theo. L. Condron designing reinforced concrete and steel structures except few months employed by the C. M. & St. P. R. R. on masonry design; January, 1906, to January, 1907, asst. engineer, American Bridge Co., on elevated work, South Chicago; January, 1907, to July, 1908, draftsman detailing department, Phoenix Bridge Co.; and July, 1908, to date with J. R. Worcester & Co., Boston. Recommended by C. H. Parker, J. R. Worcester, G. H. Brazer and E. E. Pettie.

OLIVER WHITCOMB HARTWELL, Somerville, Mass., (b. 1886). Graduated from Harvard University with degree of A. B. (*Magna cum laude in applied mechanics*). While at college took course prescribed for civil engineers in the Lawrence Scientific School. Was transitman for the Boston Elevated Railway Co. from June to September inclusive in 1907; was made an assistant in the State Board of Health, Engineering Dept., June, 1908, and continues to hold that position. Recommended by X. H. Goodnough, L. J. Johnson, G. A. Kimball and J. R. Worcester.

HENRY BENJAMIN LOXTERMAN, Pittsburg, Pa., (b. 1883). Educated at Pittsburg High School, at International Correspondence School in electrical engineering and in structural design at School of Structural Drafting, Boston. September 1, 1901, to March 31, 1904, engineer and draftsman, Westinghouse Electric Mfg. Co.; November 30, 1904, to May 1, 1906, draftsman, Bureau of Filtration, Pittsburg, Pa.; May 1, 1906, to present time, engineer Blaw Collapsible Steel Centering Co., Pittsburg. Recommended by W. B. Fuller, T. H. Wiggin, Morris Knowles and F. H. Robbins.

ROLF RAYMOND NEWMAN, Cambridge, Mass., (b. 1879). Graduate Mass. Inst. of Technology, 1904. Assistant engineer, Kern River Co., Los Angeles, Cal., November, 1904, to February, 1905; resident engineer, San Joaquin Light & Power Co., February, 1905, to June, 1906; from June, 1906, to March, 1907, resident engineer, Ransome & Smith, contractors for United Shoe Machinery Co. on concrete factory construction at Beverly, Mass.; and since March, 1907, assistant to William Wheeler, consulting engineer, Boston. Recommended by William Wheeler, R. S. Weston, Leonard Metcalf and C. W. Sherman.

RICHARD H. RICH, Boston, Mass., (b. 1874). Educated in the public schools of Beverly, Mass., graduating from the High School in 1890, was one year at Mass. Inst. of Technology, 1891-2 in general studies and evening studies, Lowell Course, 1893-95. Was rodman on Salem and Peabody sewerage surveys, September, 1895; rodman and transitman, B. & M. R. R. December, 1895, to January, 1903, and assistant engineer from January, 1903, to date. Recommended by W. L. Webber, W. H. Norris, F. B. Rowell and T. P. Perkins.



## LIST OF MEMBERS.

## ADDITIONS.

JAMES R. BALDWIN . . . . .	12 Elm St., Woburn, Mass.
JOHN V. BLECKMAN, JR. . . . .	155 Milk St., Boston, Mass.
ARMAND W. BENOIT . . . . .	34 Salem St., Lawrence, Mass.
ALFRED W. PARKER . . . . .	Worcester Lane, Waltham, Mass.
HENRY B. PRATT . . . . .	724 Lexington St., Waltham, Mass.
HARRY E. SAWTELL . . . . .	44 Everett St. Medford, Mass.
GILBERT SMALL . . . . .	428 Lexington St., Waltham, Mass.

## CHANGES OF ADDRESS.

LESLIE W. MILLAR . . . . .	378 Wabash Ave., Chicago, Ill.
FRANK B. SANBORN . . . . .	Univ. of Illinois, Urbana, Ill.
HERBERT R. STEARNS . . . . .	709 Washington St. Brighton, Mass.
WALTER T. WILEY . . . . .	15 Westcott St. Dorchester Centre, Mass.

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## Irving Tupper Farnham.

Director, Boston Society of Civil Engineers.

Clerk, Sanitary Section, Boston Society of Civil Engineers.

Born Aug. 21, 1869.

Joined the Society March 17, 1897.

Died Sept. 19, 1908.

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## MINUTES OF MEETINGS.

### SEPTEMBER MEETING OF THE SOCIETY.

BOSTON, MASS., SEPT. 16, 1908.—A regular meeting of the Boston Society of Civil Engineers was held at Chipman Hall, Tremont Temple, at 7.30 o'clock P. M. President J. R. Worcester in the chair; 69 members and visitors present.

The record of the last regular meeting and of the special meeting of July 4th were read and approved.

Messrs. James R. Baldwin, John V. Beekman, Jr., Armand W. Benoit, Harold D. Jones, James M. McNulty, Luis G. Morphy, Alfred W. Parker, Henry B. Pratt, Harry E. Sawtell and Gilbert Small were elected members of the Society.

Mr. E. W. Howe called attention to the fact that the Board of Harbor and Land Commissioners had no authority by which it could keep on sale the atlas sheets of the map of the Commonwealth prepared by the United States Geological Survey, and suggested that as it has been a great convenience to engineers to be able to purchase these sheets from the Board, it would be well to petition the Legislature that authority be given the Board to keep a stock of the sheets on sale at all times.

On motion, it was voted to authorize its officers to sign the petition on behalf of the Society.

Mr. Benjamin Fox gave a very full description of a foundation put in by him where cast reinforced concrete piles were used. Mr. Sanford E. Thompson followed with notes of tests which he had made with regard to driving these piles.

Mr. M. M. Cannon, member of the American Society of Civil Engineers, gave a very interesting talk describing the construction of the Steamship Terminals at Brunswick, Ga., and the pier at the Navy Yard, Charleston, S. C., with special reference to the concrete piles used in those structures. Lantern slides were used to illustrate the descriptions given by the speakers.

After passing a vote of thanks to Mr. Cannon for his kindness in presenting the subject before the Society, the meeting adjourned.

S. E. TINKHAM, *Secretary*.

## OCTOBER MEETING OF THE SANITARY SECTION.

A regular meeting of the Sanitary Section was held at the Boston City Club, Oct. 7, 1908. Messrs. Gardner S. Gould and Raymond W. Parlin were elected members of the Section.

Mr. Harry W. Clark, Chemist of the Massachusetts State Board of Health, gave an interesting account of his observations of sewage disposal works in England and on the continent during a recent trip to those countries. The paper was discussed by Leonard P. Kinnicutt, Earle B. Phelps, Mr. Pitman of the Baltimore Sewerage Commission and others.

A committee of three was appointed by the Chair to make nominations for a Clerk to take the place of Irving T. Farnham, deceased. As a result of the ballot Robert Spurr Weston was elected Clerk of the Section.

ROBERT SPURR WESTON, *Clerk*.

## LIBRARY NOTES.

### RECENT ADDITIONS TO THE LIBRARY.

#### State Reports.

New York, Annual Report of the Public Service Commission, 1907.

Massachusetts, Annual Report on Comparative Financial Statistics, 1907.

Wisconsin, Bulletin XX, Water Power.

#### City and Town Reports.

Chicago, Ill., Annual Report, Department of Public Works, 1907.

Detroit, Mich., Annual Report of Department of Parks and Boulevards, 1908.

Holyoke, Mass., Annual Report of Board of Water Commissioners, 1907.

New Orleans, La., Semi-Annual Report of Sewerage and Water Board, June, 1908.

New York, N. Y., Report on Cooling and Ventilation of Subway.

Philadelphia, Pa., Annual Report of Department of Public Works, 1907.

Springfield, Mass., Little River Water Supply, Contract No. 4.

Toronto, Ont., Annual Report of City Engineer, 1907.

#### Miscellaneous.

Dictionary of the English Language. Stormonth.

Road Preservation and Dust Prevention. Wm. P. Judson.

Principles and Practice of Surveying, Part II. C. B. Breed, G. L. Hosmer.

FREDERIC I. WINSLOW, *Librarian*.

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## PERSONAL NEWS.

(Under this heading it is proposed to publish each month personal news relating to members of the Society. All such items of interest should be sent to the Secretary of the Society by the first day of each month. The co-operation of members is asked to make this column a success, and they are urged to send in notes even when of a personal nature.)

Mr. Robert Spurr Weston has been elected clerk of the Sanitary Section of the Society in place of Mr. I. T. Farnham, deceased.

Mr. H. K. Barrows has been appointed a member of the Committee on Excursions of the Society in place of Mr. E. M. Blake resigned.

\* \* \*

Prof. George F. Swain has been appointed a member of the Inland Waterways Commission, which President Roosevelt has now made a permanent body.

\* \* \*

Mr. Ernest W. Wiggin, superintendent of bridges and buildings of the N. Y., N. H. & H. R. R., has resigned and will be succeeded by Mr. F. K. Irwin, construction engineer. Mr. Wiggin was formerly engineer of bridges and buildings at the Missouri Pacific Ry.

\* \* \*

Mr. Caleb M. Saville, assistant engineer, Isthmial Canal Commission, has been placed in charge of the Third Division, Department of Construction and Engineering. He will have charge of all matters referring to general surveys not property belonging to any one division, and of the collection and compilation of all data connected with meteorology and river hydraulics.

\* \* \*

Prof. Charles D. Bray, professor of mechanical and civil engineering at Tufts College, has resigned after holding the position for 39 consecutive years. He was graduated from Brown University in 1864, and served on the corps of instruction of that institution for a short time. Later he attended the U. S. Naval Academy at Annapolis, and in 1869 accepted his present position at Tufts.

\* \* \*

Mr. Edmund M. Blake, of the firm of Blake and Symonds, Consulting Civil Engineers, 8 Beacon Street, Boston, has been engaged by J. G. White & Company, Inc., of New York to represent them in southern Idaho in connection with the management of the Idaho Irrigation Company, Ltd. The firm of Blake & Symonds will be maintained at the above address for the present.

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Messrs. Hazen & Whipple of New York have been retained to prepare plans and specifications for the water purification works of Toronto and to act as consulting engineers during their construction. The late James Mansergh recommended filters as a part of the improvements of the Toronto water supply which are now being executed, but his plans called for open filters, which are impracticable for the rigorous winters of the city.



## NEW ENGINEERING WORK.

(Under this head the Excursion Committee proposes to present each month a brief resume of engineering work in progress in New England, as far as such information is readily obtainable. The assistance of members is desired, and items of interest will be gladly received. Such items are intended to include not only works of exceptional magnitude or containing novel features, but also engineering construction work of all kinds and all degrees of magnitude. Notes should be in the hands of the Committee not later than the 2nd Wednesday of each month. The thanks of the Committee are due to the members who have furnished data for the Bulletin.—R. W. LOUD, Secretary, Excursion Committee, 1 Ashburton Place, Boston.)

**Commonwealth of Massachusetts.**—**METROPOLITAN WATER AND SEWERAGE BOARD, WATER WORKS.**—Work of laying a 48-inch cast iron main for the purpose of reinforcing the supply in the Boston low-service district is in progress in Longwood Avenue, Brookline.

**SEWERAGE WORKS.**—*South Metropolitan System.*—Construction is in progress, in Brighton, on the extension of the High Level Sewer, consisting of a concrete sewer, ranging in diameter from six to seven feet, in open cut and deep rock tunnel.

*North Metropolitan System.*—Construction is in progress on modifications and extensions of the suction and discharge channels at the Deer Island Pumping Station preparatory to the installation of a fourth pump.

**CHARLES RIVER BASIN COMMISSION.**—*Work in Progress at the Dam and Lock.*—Navigation has been passing through the Lock since September 1st, and it is expected that the shut-off dam will be completed and that all vessels will be locked through by the time this bulletin is issued.

The house at the lower lock-gate with the operating tower is roofed in and nearly ready for occupancy.

The house over the upper gate is only about one-third finished.

*At the Sluices.*—All the sluice-gates are in operating condition, and the small boat lock is ready for hand operation.

*Boston Embankment and Boston Marginal Conduit.*—The entire conduit is practically completed. A few of the submerged outlets for the permanent overflows are not yet finished, but probably will be completed before the end of the year. The substructure of the Fens gate-house is finished and the foot bridge over the outlet of the Fens Pond is practically completed.

*Cambridge Marginal Conduit.*—The last 200 feet of this conduit is now under way and will probably be completed inside of a month.

**METROPOLITAN PARK COMMISSION.**—*Middlesex Fells Reservation.*—Work of construction of reinforced concrete bridge of 3 arch spans for electric railway at Brooks Road is in progress.

*Mystic River Reservation.*—Work of construction of dam, weirs, tide gates, etc., at Cradock Bridge is in progress.

*Mystic Valley Parkway.*—The work of construction of reinforced concrete bridge over Alewife Brook is in progress.

**HIGHWAY COMMISSION.**—State highways are now under construction in the following cities and towns:—

Adams,	Goshen,	No. Andover,
Boston,	Granby,	Orleans,
(Washington St., W. Roxbury)	Greenfield,	Palmer,
Brewster,	Hanover,	Sharon,
Deerfield,	Harwich,	Somerville,
Duxbury,	Ipswich,	Westminster,
Gardner,	Methuen,	Windsor.

**HARBOR AND LAND COMMISSION.**—The following pieces of work are now actually in construction:—

(1) The construction of stone jetties and excavating a basin at Deacon's Pond in the town of Falmouth for a boat harbor.

(2) The construction of two stone jetties at Cuttyhunk Harbor to protect the entrance to the harbor and direct the current so that it will scour a channel across the bar. These jetties are nearly completed.

(3) The construction of an oak pile wharf at Penikese Island—the leper colony.

(4) The construction of an earthen dike, with timber core wall and sluices for diking out the sea and draining about 1,100 acres of salt marsh at Herring River, Wellfleet, primarily for the purpose of preventing the breeding of mosquitos, and secondarily, to create tillage land from the salt marsh.

(5) The construction of a stone jetty and the widening of the entrance to West Bay in the village of Osterville in Barnstable.

(6) The dredging of the entrance and a channel within the harbor of East Bay at Osterville in Barnstable.

(7) The enlargement of the anchorage basin near Savin Hill in Dorchester Bay.

(8) The dredging of an anchorage basin in Winthrop Harbor near the club house of the Winthrop Yacht Club.

(9) The dredging of the anchorage basin at Bird Island in Boston Harbor. All the area has now been dredged over, but some shoals that remain must be removed before the whole area is excavated to the depth of 30 feet at mean low water.

(10) The dredging of some shoals in Weymouth Fore River, near Braintree Bridge.

(11) The enlarging of the anchorage basin in Rockport Harbor by the removal of boulders.

(12) The dredging of a channel in Rock Creek, in Eastham and Orleans.

In addition to the above work, contracts have been let and work will shortly begin on the following projects:—

(1) The dredging of the channel and anchorage basin in West Falmouth Harbor.

(2) The dredging of about 700,000 cubic yards in Plymouth Harbor, to form a channel from the cow yard to the wharf of the Plymouth Cordage Company.

Bids are to be received on October 23d for the construction of a stone jetty from 500 to 700 feet in length at Sesuit Harbor, East Dennis.

**Boston Transit Commission.**—It is expected that the Washington-Street Tunnel work in progress about Oct. 15, 1908, will consist mainly of making the changes in the old Subway in Haymarket Square and under the Relief Hospital.

**New York, New Haven & Hartford Railroad.**—New double track drawbridge over Taunton River at Somerset, Mass., in place of old light single-track drawbridge built by the Keystone Bridge Company in 1877.

This bridge is a center bearing swing bridge, 320 feet center to center of end bearings, operated by electricity from the Railroad Company's power house at Warren, R. I., giving two waterway openings to navigation of 100 feet in the clear. The total superstructure will weigh about 2000 tons. The bridge is practically completed.

**City of Boston.**—ENGINEERING DEPARTMENT.—NORTHERN AVENUE.—The new bridge over Fort Point Channel has been completed and will be opened for travel within a few days. Work on the sea walls at the head of Docks Nos. 2 and 3 is now in progress. The piles for the wall at Dock No. 2 have been driven and most of the concrete foundation is in place. The wall at the head of Dock No. 3 is completed for about two-thirds of its length, as far as can be built until the landing bridge is removed. The timber bulkhead across pier 3 is built and most of the filling back of it is in place.

**STREET DEPARTMENT.—Sewer Division.**—There is now in progress in this Division the following work, which may prove interesting :—

In Jamaica Plain a section of the Commissioners' Channel of Stony Brook—reinforced concrete conduit, 20 feet by 16 feet, on which the contractor is using an orange peel dredge bucket for excavating, a steam hammer for driving plank, and a peculiar form of metallic forms for arch and sidewalls.

In Roxbury there are three sections being done by contract and one by day labor on the Old Channel of Stony Brook in Rogers Avenue and Whittier Street between Huntington Avenue and Tremont Street. This construction is a double flat top channel, 8 feet 3 inches by 10 feet 6 inches high, built of steel concrete, and carries pipe sewers on each side of the conduit.

At Huntington Avenue, where the work is being done by day labor, there is a 42-inch water main to be cradled and supported across the trench, which here is 29 feet wide.

There is another section of this work of rebuilding the Old Channel of Stony Brook in progress between Linden Park Street and Vernon Street, chiefly interesting on account of the difficulty of handling material under the buildings of the Tower Oil Cloth Company.

**Boston Elevated Railway.—ELEVATED AND SUBWAY CONSTRUCTION.—Forest Hills Extension.**—The erection of steel-work for the extension is now complete, extending about 400 feet south of Forest Hills Square. All work on the Egleston Square Station will be completed this month.

**Station Alterations.**—Extensions of platforms, to accomodate 8-car trains on the elevated, are under way at Northampton St., Rowes Wharf, State St., and Battery St. stations. Platforms at all other stations are to be extended temporarily for 6-car trains, while awaiting material for permanant 8-car extensions. Work has been started on the extensive alterations to be made at the Dudley St. Terminal. Foundations for new location of the structure and station at City Square have been commenced.

**East Cambridge Extension.—North Approach to Washington-Street Tunnel.**—Elevated trains and surface cars have been diverted from the old south bound track to new location. The old south bound elevated structure and a portion of the old foundations are being removed, while new foundations to the new structure are being constructed preparatory to the final change early in November.



*East Cambridge Extension. — Charles River Bridge.*—Two of the piers for the Charles River Bridge are completed, three others are substantially completed and work is under way on two adjacent to the new lock, and on the one on the easterly side of the sluices.

**Boston & Albany Railroad.**—WORK IN PROGRESS.—Engine house, machine shop, coal pocket, ash pits, interlocking tower and track changes, Beacon Park, Allston, Mass.

Dredging, pile driving, wall extension, temporary grain elevator and grain galleries, East Boston, Mass.

Reconstruction of second track trestle bridge at Chelsea Creek, Boston & Chelsea, Mass.

New freight house and grading for new tracks and driveways, East Cambridge Yard.

Abolition of grade crossing west of Hammond Street, Worcester.

Third tracking, Jamesville to Webster Junction, Mass., Chatham and East Greenbush, N. Y.

Work for additional yard tracks at Springfield and West Springfield, Mass.

Abutments at Bridges 161–162 Hinsdale to Dalton.

Wall and abutment at Van Hoesen, N. Y.

New passenger station at Richmond, Mass.

New engine house at Rensselaer.

WORK CONTEMPLATED FOR IMMEDIATE CONSTRUCTION.—Superstructure for "Cunard Pier," East Boston, Mass. Bids for general contract and steel frame have been asked for.

New engine house, West Springfield, Mass. Bids have been received.

Coal pocket at Riverside.

Plans and specifications ready for new abutments and piers for bridge over Westfield River at Russell, Mass., and for grading new approaches; bridge to pass over tracks to eliminate grade crossing.

New abutment at Bridge No. 196, East Chatham. Bids have been asked for. Grading for third track at this place.

**Chelsea, Mass.**—Work on the reinforced concrete stables for the City of Chelsea is now well under way. The buildings are located between Fifth and Vale Streets and have a frontage of 255 feet. The stable carriage house, smithy and other buildings are grouped about a central courtyard. The stable occupying the centre of the inclosure will contain 24 open and two box-stalls,

in addition to the harness and feed rooms and offices. It is a one story building with lofts and cellars, and contains all the modern conveniences in stable construction. The paint shop, smithy, steam roller house, team sheds and city scales building surround the court on two sides, while the remainder of the inclosure is fenced in by an ornamented concrete wall. The buildings will be as nearly fireproof as it is possible to make them. Benjamin Fox, Inc., is the contractor and the contract price is \$40,650.

**Portland, Me.**—The reinforced concrete building which the Aberthaw Construction Company are building for Hon. J. P. Baxter, opposite the Lafayette, has been increased from six to eight stories. The contract for the brick and carpentry and partitions, as well as the concrete, has been given to the Aberthaw Construction Company. The work is being pushed night and day. The second floor was in place one week after the first floor had been cast, and the whole job is as good an example of well-handled quick work as is available in New England at the present time. The arrangements for mixing concrete are especially effective, and the contractor's equipment is unusually well laid out.

**Bellows Falls, Vt.**—The low water conditions in the Connecticut have made it possible to push work on the Bellows Falls Canal Company's dam with unusual rapidity. All but 100 feet of the dam is now in place. The big cofferdam in the deep part of the Vermont shore was in place the 10th of October. This job has an especially effective concrete mixing plant. Concrete is being handled into place for a very few cents per yard. All gravel is being washed as it goes into the bins, and the layout of the plant is interesting. The new concrete dam is built against the old crib dam and the handling of water through this leaky structure, and the back water in the river below the cofferdam makes this work worth careful investigation.

**East Walpole, Mass.**—The Aberthaw Construction Company are building for the F. W. Bird Company two air-tight lime bins. These are hopper bottom, somewhat irregular in shape, and are interesting only as an odd use of reinforced concrete.

**Everett, Mass.**—The Aberthaw Construction Company is working on the walls and roof of a reinforced concrete office and store building. This is laid out for future additions to the height, and at this time is being finished with a false wooden roof built over the upper concrete floor.

**Springfield, Mass.**— On the new Little River Water Supply for the City of Springfield four contracts have now been let.

On contract No. 1, on which there are new Contractors, F. T. Ley & Company of Springfield, Mass., replacing the Culgin-Pace Contracting Company of New York.

Contract No. 2, The Charles R. Gow Company, Boston, Mass., covering three acres of filters, about one-half completed.

Contract No. 3, The Baker Construction Company, New York, N. Y., a sixteen million gallon clear water resevoir. Work well under way.

Contract, No. 4, which was let on Sept. 9, 1908, to the T. A. Gillespie Company, 90 West St., New York, N. Y., for twelve miles of 42-inch lock-bar steel pipe for \$428,000. Time of completion Nov. 1, 1909.

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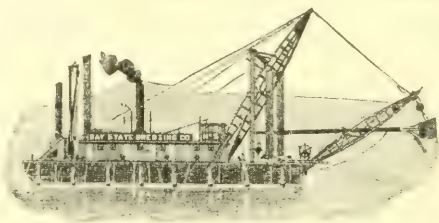
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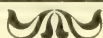


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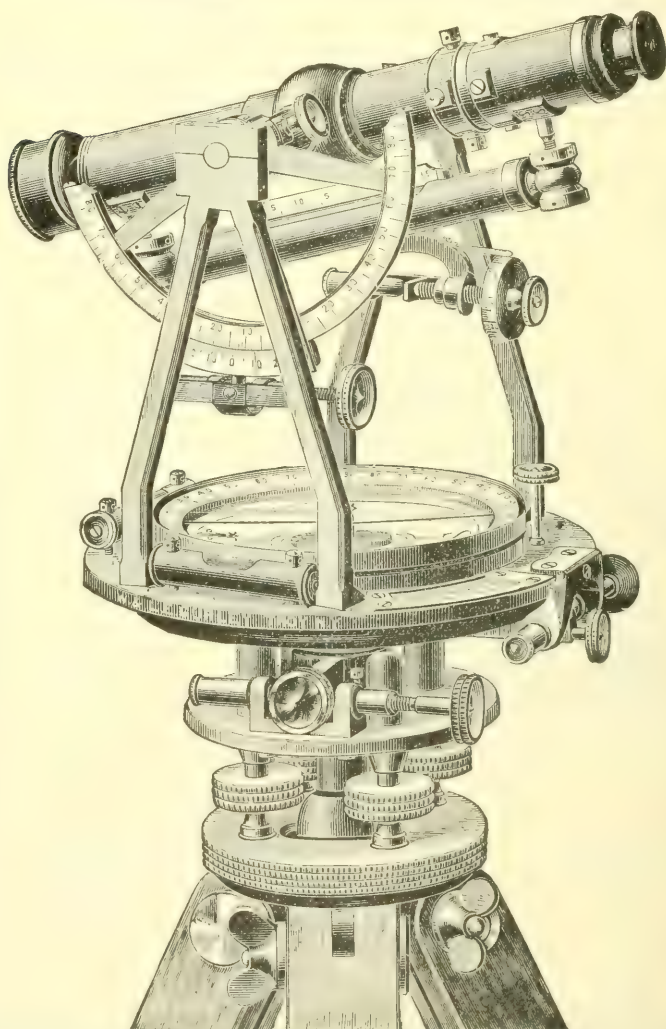
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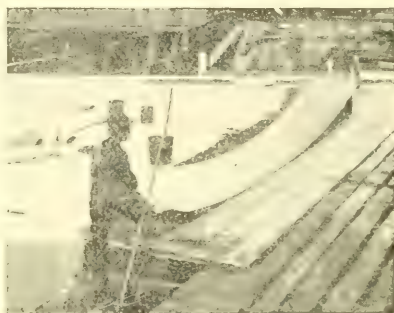
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# BOSTON SOCIETY OF CIVIL ENGINEERS.

ORGANIZED JULY 3, 1848.

## MONTHLY BULLETIN.

NEW SERIES.

NOVEMBER, 1908.

No. 26.

### REGULAR MEETING.

A regular meeting of the Boston Society of Civil Engineers will be held on Wednesday, November 18, 1908, at 7.30 p. m., in

CHIPMAN HALL, TREMONT TEMPLE, BOSTON.

Mr. J. G. Callan of the General Electric Co. will read a paper entitled "The Small Steam Turbine, Considered from an Engineering and Commercial View-point."

BUSINESS OF THE MEETING: To ballot on the applications for membership as announced in this notice.

To elect a Director for the term expiring March, 1909.

To consider the report of the Committee on Larger Membership and Clubhouse presented at the last meeting and by vote of the Society referred to this meeting for discussion. The report is printed in this *Bulletin*.

S. E. TINKHAM, *Secretary*.

### EXCURSION.

There will be an excursion on Wednesday afternoon, Nov. 18, 1908, to inspect the Northern Avenue Bridge; across Fort Point Channel from Atlantic Avenue near Oliver Street to the Freight Terminals at South Boston Flats. Members who care to inspect the bridge only will meet on the draw span at 3 o'clock.

Before examining the bridge those who desire to see a reinforced concrete pile driven are requested to meet on Northern Avenue near the Grain Elevator of the N. Y., N. H. & H. R. R., South Boston Flats, at 2 o'clock. Mr. W. L. Miller, who is



building a sea wall across the ends of Docks 2 and 3, has cast a concrete pile 18 inches square, similar to those described by Mr. Cannon at the September meeting of the Society, and it will be driven by means of a water jet at that time for the inspection of members.

Take Summer Street car to B Street, go down the stairs to Congress Street and thence across the freight yard to the Grain Elevator.

#### EXCURSION COMMITTEE.

#### DESCRIPTION OF NORTHERN AVENUE BRIDGE SUPERSTRUCTURE AND TURNING AND LIFTING MECHANISM OF THE DRAW SPAN.

This bridge was designed to carry a freight railway track on the centre roadway beside the usual city traffic. Spans 1 and 2 are through truss spans substantially alike, each having four pin connected trusses about 150 feet long, spaced 22 feet 8 inches on centre, supporting three roadways and two overhanging sidewalks, and span 3 is a deck plate girder span made up of six plate girders about 14 feet  $9\frac{1}{2}$  inches apart with an average span of about 55 feet carrying a freight railway track transversely across the span near the abutment end.

The draw span is a symmetrical swing draw of the rim bearing type 283 feet long and 79 feet,  $1\frac{1}{2}$  inches between sidewalk fascias. It is made up of two independent spans about 125 feet, 2 inches long supported on a central tower. The outer trusses are carried by the inner ones by means of two cross trusses at the central tower. This tower carries the load to eight points on a circular drum, 40 feet in diameter, through a system of distributing girders all weighing about 1300 tons and resting on 56 steel wheels running between steel faced tracks.

In all spans the floor beams are of built up sections with steel stringers. The roadways of Spans 1, 2 and 3 are paved with 6-inch granite blocks, with pitch and pebble joints, laid on 6-inch hard pine timber, covered with waterproofing and sand, and the sidewalks are 4 inches of asphalt on 4-inch plank. The roadway of the draw span is 5-inch hard pine timber sheathed with 2-inch spruce plank and the sidewalks are of 2-inch hard pine.

The power used for operating the draw is compressed air at a normal pressure of 200 lbs. per square inch. This is generated by two 50 H. P. motor driven air compressors, these compressors

pump directly into a 4-inch main pipe leading to the centre of the draw and into eight receivers in the power house, with a combined capacity of 1500 cubic feet of air. From the 4-inch main the air after passing through a reducing valve which reduces the pressure to 60 lbs. runs two 6½ inch by 10 inch double cylinder reversing engines which in turn swing the draw operating through a convenient train of gears and a pinion working in a rack fixed to the lower track.

The end lifting device consists of a lever suspended below the bottom cord at the outer end of each truss operated by a 16-inch vertical air cylinder. These cylinders take air direct from the 4-inch main at a pressure of 180 to 200 lbs. per square inch.

The ends of the draw after having been raised are lowered on to flat blocks thus giving perfect rigidity when the draw is in place for street traffic. These blocks are pushed in place by the gatemen who operate a lever from the deck of the fixed spans.

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### INFORMAL MEETINGS.

The practice, which has proved acceptable in former years, of holding informal meetings on Wednesday evenings not assigned to the regular meetings of the Society and the Sanitary Section, will be continued this winter.

Meetings will be at 7.45 in the Society's Library, 715 Tremont Temple.

Complaint has been made that many members fail to attend these meetings because the announcement is given in the *Bulletin* so far in advance of the date at which the meeting is held. The Board of Government has thought it unnecessary to send out notices of these meetings a second time to the over 650 members, but in order to reach those who are especially interested and are likely to attend it has instructed the Secretary to send postal card notices to all who request them. The Secretary therefore asks all members who desire these notices sent regularly to notify him. It has been suggested that in an office where there are a number of members located, a single notice sent to that office and posted in a conspicuous place would reach all of its members.

On Dec. 9, 1908, Mr. Frederick S. Green, Vice-President of the Waterproofing Company of New York, will describe the Hyrolithic System of Waterproofing. The talk will be illustrated by a number of lantern slides showing the advantages of the system and the different methods of application.

## CANDIDATES FOR MEMBERSHIP.

To be balloted on at meeting Nov. 18, 1908.

### AS MEMBERS.

EDWIN FRANCIS ALLBRIGHT, Milton, Mass., (b. 1881). Graduate Mass. Inst. Technology in civil engineering class of 1904. With the Southern Railway in the Bridge Dept. from August, 1904, to August, 1908, the last two years as assistant engineer, and at present with J. R. Worcester & Co., Boston. Recommended by G. H. Brazer, J. R. Worcester, E. E. Pettee and F. L. Murray.

HENRY MASON CHADWICK, Malden, Mass., (b. 1871). At Mass. Inst. of Technology, September, 1889, to June, 1890. September, 1890, to April, 1892, with Child Acme Cutter & Press Co., Boston, as timekeeper and draftsman on paper cutting machines; April, 1892, to September, 1894, draftsman, Boston Bridge Works; September, 1894, to April, 1895, draftsman, Berlin Iron Bridge Co.; April, 1895, to January, 1896, draftsman and checker, Boston Bridge Works; January, 1896, to September, 1900, with Boston Bridge Works in various capacities, draftsman, checker, foreman of assembling gangs and riveting gang and squad foreman in drafting room; September, 1900, to April, 1901, checker for New England Structural Co.; and April, 1901, to date with Boston Bridge Works, in drafting room, supervising structural details of bridges, buildings and other structures, designing and detailing travelers and falsework for erection and in direct charge of machinery details for drawbridges. At present assistant engineer of construction. Recommended by J. C. Moses, J. R. Worcester, J. P. Snow and M. F. Brown.

JOHN EARL CUNNINGHAM, Kingston, Mass., (b. 1882). Summer, 1902, rodman with Baltimore & Ohio R. R.; June to October, 1904, material man and inspector on construction of electric railway between Alton and East St. Louis, Ill. (J. G. White & Co.); October, 1904, to January, 1905, concrete inspector for Illinois Terminal R. R.; January, 1905, to January, 1906, with Theo. L. Condron designing reinforced concrete and steel structures except few months employed by the C. M. & St. P. R. R. on masonry design; January, 1906, to January, 1907, asst. engineer, American Bridge Co., on elevated work, South Chicago; January, 1907, to July, 1908, draftsman detailing department, Phoenix Bridge Co.; and July, 1908, to date with J. R. Worcester & Co., Boston. Recommended by C. H. Parker, J. R. Worcester, G. H. Brazer and E. E. Pettee.

OLIVER WHITCOMB HARTWELL, Somerville, Mass., (b. 1886). Graduated from Harvard University with degree of A. B. (*Magna cum laude in applied mechanics*). While at college took course prescribed for civil engineers in the Lawrence Scientific School. Was transitman for the Boston Elevated Railway Co. from June to September inclusive in 1907; was made an assistant in the State Board of Health, Engineering Dept., June, 1908, and continues to hold that position. Recommended by X. H. Good-nough, L. J. Johnson, G. A. Kimball and J. R. Worcester.

HOWARD BENJAMIN LOXTERMAN, Pittsburg, Pa., (b. 1883). Educated at Pittsburg High School, at International Correspondence School in electrical engineering and in structural design at School of Structural Drafting, Boston. September 1, 1901, to March 31, 1904, engineer and draftsman, Westinghouse Electric Mfg. Co.; November 30, 1904, to May 1, 1906, draftsman, Bureau of Filtration, Pittsburg, Pa.; May 1, 1906, to present time, engineer Blaw Collapsible Steel Centering Co., Pittsburg. Recommended by W. B. Fuller, T. H. Wiggin, Morris Knowles and F. H. Robbins.

ROLF RAYMOND NEWMAN, Cambridge, Mass., (b. 1879). Graduate Mass. Inst. of Technology, 1904. Assistant engineer, Kern River Co., Los Angeles, Cal., November, 1904, to February, 1905; resident engineer, San Joaquin Light & Power Co., February, 1905, to June, 1906; from June, 1906, to March, 1907, resident engineer, Ransome & Smith, contractors for United Shoe Machinery Co. on concrete factory construction at Beverly, Mass.; and since March, 1907, assistant to William Wheeler, consulting engineer, Boston. Recommended by William Wheeler, R. S. Weston, Leonard Metcalf and C. W. Sherman.

RICHARD H. RICH, Boston, Mass., (b. 1874). Educated in the public schools of Beverly, Mass., graduating from the High School in 1890, was one year at Mass. Inst. of Technology, 1891-2 in general studies and evening studies, Lowell Course, 1893-95. Was rodman on Salem and Peabody sewerage surveys, September, 1895; rodman and transitman, B. & M. R. R. December, 1895, to January, 1903, and assistant engineer from January, 1903, to date. Recommended by W. L. Webber, W. H. Norris, F. B. Rowell and T. P. Perkins.

## DECEMBER AND JANUARY MEETINGS.

It is expected that at these meetings the following papers will be presented:—

Dec. 16, 1908. Boylston Street Bridge, Boston, from 1888 to the present time; the destruction and reconstruction of a bridge subjected to locomotive fumes and increasing street car loads, by F. H. Fay, C. M. Spofford, S. H. Thorndike and J. C. Moses. Illustrated by lantern slides.

Jan. 27, 1909. A specification for Filing and Indexing Railroad Plans, by H. K. Higgins. The Filing and Indexing Systems of the Board of Water Supply of the City of New York, by Alfred D. Flinn.



# MINUTES OF MEETINGS.

## OCTOBER MEETING OF THE SOCIETY.

Boston, Oct. 21, 1908.—A regular meeting of the Boston Society of Civil Engineers was held at Chipman Hall, Tremont Temple, at 7.35 o'clock P. M., President Joseph R. Worcester in the chair. Fifty-eight members and visitors present.

The record of the last meeting was read and approved.

Messrs. Edward E. Albee, Hermon R. Bliss, Alvin W. King, Charles H. Pease, Ralph E. Rice, Ralph B. Saunders, Albert T. Sprague, Jr., Herman F. Tucker and George S. Whithead were elected members of the Society,

The President announced the death of Irving T. Farnham, a director of the Society, which occurred on Sept. 19, 1908. On motion of Mr. French, the Chair was requested to appoint a committee of three to prepare a memoir. The Chair appointed as that committee, Messrs. Charles W. Sherman, Henry D. Woods and Charles W. Ross.

The President also announced that a vacancy existed in the office of director for the term expiring in March, 1909, occasioned by the death of Mr. Farnham, and, on motion of Mr. Howe, it was voted that the vacancy be filled at the next meeting of the Society.

Mr. Cowles, for the Committee on Larger Membership and Clubhouse, submitted and read its report.

On motion of Mr. Winslow, it was voted that the report be referred to the next meeting for discussion and that it be printed in the November *Bulletin*.

It was also voted that the thanks of the Society be extended to Mr. Vernon V. Skinner, Penal Commissioner of Boston, for courtesies shown members of the Society on the trip to Deer Island on Oct. 21, 1908.

The President then introduced Dr. Edward V. Huntington, professor of mathematics at Harvard University, who, with the aid of lantern slides, gave a very interesting lecture entitled, "A Study of the Motion of the Gyroscope, with special reference to the Brennan Mono-Rail Car."

Prof. Ira N. Hollis followed with a description of the application of the gyroscope to the Howell Torpedo.

After passing a vote of thanks to Professor Huntington for his interesting lecture on the gyroscope, the Society adjourned.

S. E. TINKHAM, *Secretary*.

## BOSTON SOCIETY OF CIVIL ENGINEERS.

ORGANIZED JULY 3, 1848.

### REPORT OF COMMITTEE ON LARGER MEMBERSHIP AND CLUBHOUSE.

BOSTON, October 21, 1908.

*To the Members of the Boston Society of Civil Engineers:*

The special Committee on Larger Membership and Clubhouse, which was appointed "to investigate and report upon the question of securing new quarters along the lines outlined in the communication of Mr. L. S. Cowles, of March 18, 1908," begs leave to offer the following report:

#### CLUBHOUSE.

Your committee deems it desirable for the Society to own a clubhouse, but fears it is not sufficiently strong financially to undertake the acquisition of a suitable property at the present time. With additional funds and a larger membership such a house might be provided and successfully conducted. Its acquisition might be effected by means of the "Permanent Fund" of the Society, but your committee feels that it would be unwise to recommend such a purchase unless the fund (now about \$22 000) amounted to at least 75 per cent. of the total outlay. Further, there should be very favorable prospects of materially increasing the membership in the near future.

From an investigation of property values in Boston, it appears that \$50 000 will be required for a suitable property, including necessary alterations. Seventy-five per cent. of this amounts to \$37 500, thus requiring an increase of over \$15 000 in the Permanent Fund before such a purchase should be attempted. A mortgage of \$12 500 would hardly be considered a heavy burden on the property. To increase the Permanent Fund to this extent, and to provide sufficient income to successfully manage affairs after the acquisition of the building, will require a much larger membership than at the present time. While the possession of a permanent home for this Society would doubtless greatly increase the membership, your committee is of the opinion that the Society cannot safely venture upon such an undertaking until such larger membership has been in part secured.

The present quarters offer slight inducement towards increased membership or towards sociability among the present members. Because of this and on account of insufficient finances to acquire a building of our own, your committee would recommend a search for and, if possible, a lease of quarters better adapted to the needs of this Society. It would be advisable to invite the New England Water Works Association and the New England Association of Gas Engineers to coöperate with us in this undertaking. Your committee believes that the plan outlined by a former committee was a step in the right direction, but was too uncertain of attainment, and was handicapped by an unfavorable location (Broad Street). The present committee has so far been unsuccessful in finding a suitable building that offers quarters more desirable than those now occupied by the Society, and recommends that the Special Committee on

Quarters be instructed that it is the desire of this Society that more convenient quarters be secured, and that said committee take up the active consideration of this subject and report to the Society at the earliest opportunity.

#### LARGER MEMBERSHIP.

Inasmuch as a permanent home is desirable and can be secured only through a larger membership, it behooves the Society to take active steps to increase the number of its members. Equally important with the question of more suitable quarters is that of making the Society more attractive to individual members. Increased sociability and a manifest interest of one member in another are needed, both to retain present members and to attract new men. If "the encouragement of social intercourse among engineers and men of practical science" is to continue to be one of the objects of this Society, then more attention should be paid this feature than is being given it at the present time. Better quarters will prove a strong move in this direction.

Efforts should be made to become better acquainted with out-of-town members and to make them acquainted with a larger number of local men. With more convenient quarters, where cards and games might be enjoyed, in addition to the library privileges, the members would surely experience a certain social intercourse that is now lacking. As a means tending to increase the attractiveness of the Society at the present time, your committee offers the following suggestions:

(1) Establishing a Bureau of Registration for those members seeking employment or a change in position.

*Remarks.* — While our object as a Society, as set forth in the Constitution, is not necessarily a benevolent one, at the same time a slight effort on our part to aid such members as are unfortunate enough to be temporarily without employment seems only just.

(2) Additional informal meetings, where subjects may be taken up and discussed in a free manner, such discussions not necessarily to be reserved for publication.

*Remarks.* — The experience of your committee has been that many members are not inclined to enter freely into the discussion at the formal meetings. While this may be due to the proverbial modesty of the engineer, this modesty has been laid aside at many of our informal meetings. These occasions are as a rule largely attended because of their informality and because of the detailed and elementary manner in which the subjects are frequently presented. It is suggested that some of these meetings might acceptably take the form of informal lectures on the elements of various engineering subjects, such as theory of structures, sanitary engineering, reinforced concrete, etc.

(3) Sending our present *Bulletin*, gratis, to various large engineering offices in New England.

*Remarks.* — Such a distribution of our *Bulletin* would certainly be a benefit to the profession at large. The description of current engineering work should prove particularly attractive, as it is the only compilation of that nature of which we are aware. Further, the time of meetings, as well as the subjects to be dealt with, might in this way become known to various engineers, who would otherwise receive such information verbally or not at all. Such distribution would be of additional value to our adver-

tisers whom we must needs depend upon, in a measure, for the success of the publication.

(4) Publication of our proceedings and papers in a journal of our own. This would necessitate our withdrawal from the Association of Engineering Societies.

*Remarks.*—Your committee fully realizes that this question is a very delicate one, and it is only by examining critically the facts of the case that the above action has been decided upon as being for our best interest. After looking carefully into the financial side of this question, we feel assured that the step advised will not burden the Society with additional financial obligations.

That the foundation of the Association of Engineering Societies was, at the time, a wise proceeding is not to be doubted, and our affiliation with the other societies a right and proper step to take. Conditions have since changed, until our Society now seems to demand a publication more individual in character.

The following table may prove of interest as showing how the various societies comprising the "Association" contributed to Vol. XL of the JOURNAL (January-June, 1908). The figures give the number of pages of reading matter, minutes of meetings not included.

Vol. XL. January-June, 1908.									
	Boston.	Detroit.	Montana.	St. Louis.	Louisiana.	Pacific Coast.	Total.	Boston.	All Others.
January, 1908....	52						52	52	100
February, 1908...	21		33	18	3		75	21	54
March, 1908.....		31	9			9	49		40
April, 1908.....	53			3	10		66	53	13
May, 1908.....	37						37	37	100
June, 1908....	21	16	2				39	21	18
Vol. XL.....	184	47	44	21	13	9	318	184	134

NOTE. — St. Paul and Toledo did not contribute.

From the above it is seen that the Boston Society is practically monopolizing the present publication. We firmly believe that the other societies comprising the Association would benefit by our withdrawal. They would then be obliged to do their full duty toward the publication or see its immediate downfall. It should be noted that two societies have furnished no papers for this volume which contains the winter's proceedings.

Our new publication of, say, ten numbers per annum might well supersede the present *Bulletin*, all papers with discussions to reappear in an annual number, suitably arranged and indexed. Would not many of our members who are not now inclined to spend the time to prepare papers for publication in the journal of the Association, take more interest, and perhaps pride, in furnishing such material for our own publication, thus bringing forward valuable matter that might otherwise not be revealed? The papers of the other societies would still be available in their journal.



(5) That an endeavor again be made to form additional "sections" of the Society.

*Remarks.*—The recent agitation of this subject, which resulted in the formation of the Sanitary Section, has certainly proved a benefit to the Society. This Section has been a success from the start, and your committee sincerely hopes to witness the formation of a Mechanical Section, and possibly others, at an early date.

(6) Annual meeting of the Society to be made more of a function, so that out-of-town members will have incentive to be present. One entire day to be reserved for the event, with (a) the annual dinner on the preceding evening; (b) registration and annual meeting in the morning; (c) excursion in the afternoon; and (d) smoker, with light refreshments, in the evening.

*Remarks.*—At present the only real stated social function that we enjoy is the annual dinner, and that somehow fails to bring out any considerable portion of the non-resident membership. A meeting as suggested would surely give us a splendid opportunity to meet our non-resident members, and so renew acquaintances and make new ones where it is now impossible. An entire day, say the third Wednesday in March, might be devoted to this function. With the annual dinner occurring on the Tuesday night preceding, most of our New England members could attend all functions with a loss of but one day from their business. Your committee sincerely hopes that the members of this Society will see fit to inaugurate an annual meeting next March that may prove a lasting pleasure to all who may be fortunate enough to attend.

LUZERNE S. COWLES,  
CHARLES B. BREED,  
GEORGE A. CARPENTER,  
RALPH E. CURTIS,

*Committee.*

#### TABLE SHOWING GROWTH OF CIVIL ENGINEERING SOCIETIES.

##### *Canadian Society Civil Engineers.*

January, 1904, 1 145

January, 1908, 2 047 Increase in 4 years = 602, or 70 per cent.

##### *American Society Civil Engineers.*

January, 1904, 2 924

January, 1908, 4 411 Increase in 4 years = 1 487, or 51 per cent.

##### *Civil Engineers Club of Cleveland.*

March, 1904, 211

March, 1908, 276 Increase in 4 years = 65, or 31 per cent.

##### *Connecticut Society Civil Engineers.*

May, 1904, 245

May, 1908, 290 Increase in 4 years = 45, or 18 per cent.

##### *Boston Society Civil Engineers.*

July, 1904, 585

June, 1908, 660 Increase in 4 years = 75, or 13 per cent.

##### *British Institute of Civil Engineers.*

April, 1904, 7 633

April, 1908, 8 573 Increase in 4 years = 940, or 12 per cent.

## NOVEMBER MEETING OF THE SANITARY SECTION.

A special meeting of the Sanitary Section of the Boston Society of Civil Engineers was held at the Boston City Club on Wednesday, the 4th of November, at 7.30 p. m. Dr. Sumner Coolidge, for three years a physician in the Sanitary Department of the Isthmian Canal Commission, gave a very interesting and profitable lecture entitled "Sanitation of the Canal Zone," illustrated by about one hundred slides. Mr. Frederic P. Stearns presented some statistics showing the rapid improvement which had been made in the sanitary conditions, especially during the present year, and Dr. C. V. Chapin, Superintendent of Health of the City of Providence, mentioned the important changes in the methods of combatting disease which had resulted from the work of Dr. Gorgas and others, both in Cuba, and in Panama.

It was voted that the Chairman be empowered to appoint a member of the Run-off Committee in place of Mr. Farnham, deceased.

About 65 members and guests were present.

ROBERT SPURR WESTON, *Clerk.*

## SOCIETY OF ARTS MEETINGS.

Through the courtesy of the Secretary of the Society of Arts announcement is made of the following meetings of that Society:—

Dec. 2, 1908. Mr. W. S. Youngman, Secretary of the Charles River Basin Commission, will discuss the benefits of the work to Boston, with special reference to the effect the dam may have upon the park system, the development of marsh lands for business and residential purposes, and uses of the Basin for pleasure purposes. The engineering features of the work, such as unique features of the locks and arrangements for operating them in winter, etc., will be discussed by Mr. Hiram A. Miller, the Chief Engineer. Numerous lantern slides will be shown.

Dec. 17, 1908. Dr. Louis Bell will speak on "Modern Methods of Illumination," and will show some interesting slides from photographs taken abroad, showing especially the artistic effects obtained in foreign cities.

The meetings are held at 8 o'clock, in Room 6, Lowell Building, Massachusetts Institute of Technology. All interested in the subjects are invited to attend.

## MEETING OF THE BOSTON SECTION, AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS.

A meeting of the Boston Section of the American Institute of Electrical Engineers will be held on Wednesday evening, Nov. 18, 1908, at 8 o'clock, in the Auditorium of the Edison Electric Illuminating Company of Boston. This room is on the third floor of the new Edison Building, at 39 Boylston Street, Boston, between Tremont and Washington Streets.

Mr. L. L. Elden, Chief Electrician of the Edison Electric Illuminating Co., will read a paper entitled "High Potential Underground Transmission," by Peter Junkersfeld and W. O. Schweitzer. Notes on the operation of the Boston Edison Co. are to be added, and illustrated by lantern slides.

A cordial invitation is extended to the members of the Boston Society of Civil Engineers to attend this meeting.

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## MEETING OF THE NORTHEASTERN SECTION OF THE AMERICAN CHEMICAL SOCIETY.

A meeting of the American Chemical Society will be held at the Technology Union on Trinity Place, Boston, at 8 o'clock p. m., on Friday, November 20th. Prof. Henry Fay of the Mass. Institute of Technology will present a paper upon the "Effect of Manganese Sulphide in Steel," and in this connection he will discuss some of the causes of steel-rail failures. Through the secretary of the Section a cordial invitation is extended to any of the members of the Boston Society of Civil Engineers who may be interested in the subject to attend the meeting. Please note the change in location of the Technology Union, the old quarters on Garrison Street having been given up.

## APPLICATION FOR MEMBERSHIP.

The following application for membership has been received and is now before the Board of Government for approval. Members having information which will assist the government in its consideration of this application are requested to communicate at once with any member of the Board. Communications will be regarded as confidential and for the use of the Board alone.

## AS MEMBER.

JOHN GILBERT ANDREWS, Newton, Mass., (b. 1879). Graduate of Dartmouth College, Chandler Scientific Course, 1901, and Thayer School of Civil Engineering, 1902. Resident engineer, Newburyport Bridge, in charge of foundations and approaches; connected with the engineering department of the Boston Bridge Works from Spring of 1904 to Jan. 1, 1905, at which time he was appointed contracting engineer for that company, and now holds that position. Recommended by J. P. Snow, W. G. S. Chamberlain, R. A. Shailer and S. E. Tinkham.

## LIST OF MEMBERS.

## ADDITIONS.

HERMON R. BLISS	68 Baker St., Providence, R. I.
GARDNER S. GOULD (Sanitary Section)	Newton Upper Falls, Mass.
LUIS G. MORPHY	366 South Station, Boston.
JAMES M. McNULTY	27 Holman St., Allston, Mass.
RAYMOND W. PARLIN (Sanitary Section)	74 Lincoln Ave., Wollaston, Mass.
CHARLES H. PEASE	7 Water St., Boston.

## CHANGES OF ADDRESS.

EDMUND M. BLAKE	302 Overland Bldg., Boise, Idaho
GEORGE A. CLARK	Box 25, Youngstown, N. Y.
L. F. PATSTONE	Manila, R. I.
J. F. PETERSON	5 Exeter Park, North Cambridge, Mass.
HORACE ROPES	State Water Supply Commission, Albany, N. Y.
HAROLD C. STEVENS	Hering & Fuller, 170 Broadway, New York, N. Y.
CHARLES C. TURNER	198 Highland Ave., Wollaston, Mass.

## DEATH.

G. EDWARD SLEEPER	Died Oct. 25, 1908.
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## PERSONAL NEWS.

Under this heading it is proposed to publish each month personal news relating to members of the Society. All such items of interest should be sent to the Secretary of the Society by the first day of each month. The co-operation of members is asked to make this column a success, and they are urged to send in notes even when of a personal nature.

Prof. J. Ansel Brooks recently addressed the Society of Civil Engineers of Brown University on "Technical Education in France," a subject which he studied while on leave of absence last year.



Mr. Leonard Metcalf and Mr. Charles W. Sherman have recently returned from San Antonio, Tex., where they spent a considerable time in examination of the property of the Water Co. in behalf of St. Louis capitalists.

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Mr. Desmond FitzGerald, who has just returned from investigating engineering problems on the Pacific Coast, addressed the students of Stanford University, Palo Alto, Cal., on October 26th, on factors on water supply problems.

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Mr. Harrison P. Eddy is continuing his monthly visits to Louisville, Ky., where he is acting as Consulting Engineer to the Commissioners of Sewerage on the construction of their large main sewerage system, which has now been in progress for nearly two years.

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Messrs. Metcalf and Eddy have substantially completed their investigation of the Boston Water and Sewer Departments, which has been in progress for about one year and a quarter. The Finance Commission are to render their final report on or before December 31st.

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The Massachusetts Civil Service Commission announce competitive examinations to be held on Dec. 7, 1908, for the position of Mechanical Engineer in the Ferry Division, Street Department, Boston, and for the position of Superintendent of the Main Drainage Works, Street Department, Boston. The salary of each of these positions is \$2,500 per year.

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Mr. Charles M. Spofford, Professor of Civil Engineering at the Polytechnic Institute, Brooklyn, N. Y., was one of the engineers engaged during the past summer in investigating the strength of Blackwells Island Bridge. In addition to his work at the Polytechnic Institute, where he is in charge of his department, Professor Spofford devotes some time to consulting engineering work, and has recently opened an office in the Hamburg-American Building, New York City.

## LIBRARY NOTES.

## BOOK REVIEWS.

*The Principles and Practice of Surveying, Volume II, Higher Surveying.* By Charles B. Breed and George L. Hosmer. 8 vo.; 430 pages; 155 cuts and 7 full page plates. Price \$2.50. Published by John Wiley & Sons, New York, 1908.

[Donated by the authors.]

Professors Breed and Hosmer of the Massachusetts Institute of Technology have added a second volume to their excellent treatise on surveying, which deals in practical detail with the subject of "Higher Surveying." Surveys are frequently made, for commercial purposes, of areas sufficiently extensive to require the use of relatively inexpensive triangulation methods. This class of surveys forms the ground work of the book. This volume assumes such a knowledge of surveying as is covered by the authors' previous book; it is unusually free from needless repetition, and it is carefully cross-referenced.

*Part I* treats of the control of the survey; the instruments, apparatus and methods used in triangulation work; how to make and reduce observations to determine azimuth, latitude and time; and the practice of precise, trigonometric and barometric levelling.

*Part II* takes up the details of filling in topography, not only by the well recognized methods of the transit stadia and plane-table, but explains very clearly, though of necessity briefly, the practice of photographic surveying. The chapter on the relation of geology to topography is a valuable addition to the book, showing clearly by discussion and example the mistakes so abundant in topographic maps, and their causes.

*Part III* deals with shore lines and stream surveys, and surveys of drainage areas, storage basins and submerged areas, taking and locating soundings, and the measurement of dredged material. It also contains an excellent chapter on Stream Gauging, by Mr. H. K. Barrows, Engineer U. S. Geological Survey.

*Part IV* discusses the subject of mapping in just the necessary detail, showing conventional topographic and hydrographic signs, and well selected typical maps; and gives such tables as are required to reduce the observations described in text.

The writer thinks that the discussion of stadia and plane-table practice should form part of the previous volume on plane surveying. To the owner of both volumes, this is an unimportant matter.

For students in plane surveying, Volume I lacking discussion of topographic methods, and perhaps also of the sextant, is not entirely satisfactory. For users desiring only one volume, perhaps a large class, this subject matter could readily be added. The writer also wishes that the approximate rules for adjusting a quadrilateral had been inserted; for he thinks this adjustment is sometimes necessary in surveys of the character contemplated by the authors. The chapter on stream gauging, while excellent, is in the writer's opinion not an essential part of the book. These are, however, minor faults in an excellent treatise.

The subject matter is concisely and clearly presented, and intelligently illustrated. The authors have succeeded in keeping constantly before the reader the necessity of adapting the work to the degree of precision required; and in furnishing both by illustration and mathematical statement suitable criteria, easily understood. It is an excellent book for student and practitioner.

H. J. HUGHES.

*The Plane Table and its Use in Surveying.* By W. H. Lovell, Topographer, U. S. Geol. Survey. 12 mo.; 45 pages; 9 ills. Price \$1.00. Published by McGraw Publishing Co., New York, 1908.

Donated by the Publishers.

This little book is a welcome addition to our Engineering Library for the reason that it calls the attention of the engineer to the somewhat surprising fact that "the most rapid, economical and satisfying way of making a map yet discovered," extensively used abroad for years, if not centuries, has been set aside by the American surveyor, and the less accurate, and in the end, the more costly method by stadia, substituted in its place.

That the Plane Table is especially adapted to open river and valley work full of details, such as roads, dwellings, manufacturing plants, etc., and the stadia alone to narrow tortuous streams with their banks heavily wooded, there can be no reasonable question.

The general rush to the latter method seems to have been induced largely on account of the speed with which notes of the survey can be accumulated, forgetting that the resultant completed map is the thing desired and used. This map can only be obtained by reproducing in the office on paper an exact duplicate of the operations carried on in the field. While this does not double the work, it uses up much extra time not usually considered, and

it is right here that extra cost and inaccurate results appear due to puzzling out and interpreting by the office assistant imperfect and hastily made field sketches, without the aid of the memory of the man who made them. It must be born in mind that if the map is to be made in the office nearly twice as many points must necessarily be located than are required on the Plane-Table sketch when the "filling in" is made easy with the objects in sight.

In practise it is far more easy to secure a transitman who can read his angles and distances fairly well, and legibly record them, than to get one who can and will take the time to make a clear sketch, and show in a clean concise way the proper connections of located points. Consequently walls and fences are erroneously joined on the maps, buildings misplaced and many lines joining located points wrongly curved or directed.

Attention is called by the author to the decided advantage of the Plane Table operator in finishing his sketch with the actual topography in sight with which to test the located points and correct all errors and omissions *on the ground*.

He also alluded to, but does not amplify sufficiently, the advantages of location by triangulation, computed and graphic, over location by azimuth and distance alone, carried as it usually is by stadia over several miles without a check.

A pond from three-quarters to a mile square can be accurately mapped by this method in a day, the Plane-Table work itself requiring only three or four hours.

The Johnson form alluded to as probably the least in use will doubtless be improved in its clamp and tangent motion and the work of triangulation simplified and facilitated.

The Three-Point and Two-Point Problems are fairly outlined, but there are some short cut methods used in practice which are worthy of additional treatment.

The reference to stadia rods being marked in six-inch lengths calls to mind the importance of simplicity of graduation as against the elaborate saw-toothed or zigzag style of marking. In fact nothing can outclass the old Lake Survey rod if painted in black and yellow.

Gannett's comment in the concluding chapter calls it the "universal instrument," and the quotation from Pierce as to "precision by graphic triangulation" emphasize the fact that we are far behind the times in not training our young assistants to its skillful, proper and intelligent use.



Chapter V of "Principles and Practice of Surveying" also furnishes interesting information clearly stated, which shows that we are beginning to appreciate the best methods, and will lead to a change in engineering schools of twenty or thirty years ago, when one peep through the Alidade in a half day's experiment was all the training then thought worthy of this all-important method.

HENRY B. WOOD.

#### RECENT ADDITIONS TO THE LIBRARY.

##### **State Reports.**

Michigan, Annual Report of Board of Health, 1907.

Pennsylvania, Report of Water Supply.

##### **City and Town Reports.**

New York, Bureau of Water Supply, 4 specifications.

St. Louis, Mo., Annual Report of Water Commissioner, 1907.

Milwaukee, Wis., Annual Report of City Engineer, 1907.

##### **Miscellaneous.**

Confessions of a Railroad Signalman, James O. Fagan.

Andrew Ellicot, Life and Labors. C. V. Mathews.

The River Irwell, J. Corbett.

The last three books are the gift of Mr. Clemens Herschel.

FREDERIC I. WINSLOW, *Librarian.*

## NEW ENGINEERING WORK.

(Under this head the Excursion Committee proposes to present each month a brief résumé of engineering work in progress in New England, as far as such information is readily obtainable. The assistance of members is desired, and items of interest will be gladly received. Such items are intended to include not only works of exceptional magnitude or containing novel features, but also engineering construction work of all kinds and all degrees of magnitude. Notes should be in the hands of the Committee not later than the 2nd Wednesday of each month. The thanks of the Committee are due to the members who have furnished data for the Bulletin.—R. W. LORD, Secretary, Excursion Committee, 1 Ashburton Place, Boston.)

**Commonwealth of Massachusetts.**—**METROPOLITAN WATER AND SEWERAGE BOARD, *Water Works.***—Work of laying a 48-inch cast iron main for the purpose of reinforcing the supply in the Boston low-service district is now in progress under the Boston & Albany R. R. tracks near Longwood Station and near Coolidge Corner. The work will, however, be suspended for the winter about November 15th.

***Sewerage Work.***—Work reported in the last Bulletin on both North and South Metropolitan Systems is still in progress.

**CHARLES RIVER BASIN COMMISSION.**—***Work in Progress at the Dam and Lock.***—The gates in the shut-off dam were closed on October 20th, and filling is now being placed on either side of the gates.

***At the Sluices.***—The sluices are in operation and the water has been maintained in the Basin at the required elevation since October 27th.

***Boston Embankment and Boston Marginal Conduit.***—The entire conduit is completed and all but a few of the overflows are now discharging into the same. The work at the outlet of the Fens Pond is finished, with the exception of some filling and the superstructure for the gate-house.

***Cambridge Marginal Conduit.***—The last 100 feet of this conduit has been completed, and the entire conduit will probably be in full operation by the middle of the month.

**HARBOR AND LAND COMMISSION.**—The following pieces of work are now actually in construction:—

1. The construction of stone jetties and excavating a basin at Deacon's Pond in the Town of Falmouth for a boat harbor.

2. The construction of an oak pile wharf at Penikese Island—the leper colony.

3. The construction of an earthen dike, with timber core wall and sluices for diking out the sea and draining about 1,100 acres of salt marsh at Herring River, Wellfleet, primarily for the

purpose of preventing the breeding of mosquitos; and secondarily, to create tillage land from the salt marsh.

4. The construction of a stone jetty and the widening of the entrance to West Bay in the village of Osterville in Barnstable.

5. The dredging of the entrance and a channel within the harbor of East Bay at Osterville in Barnstable.

6. The enlargement of the anchorage basin near Savin Hill in Dorchester Bay.

7. The dredging of an anchorage basin in Winthrop Harbor near the clubhouse of the Winthrop Yacht Club.

8. The dredging of the anchorage basin at Bird Island in Boston Harbor. All the area has now been dredged over, but some shoals that remain must be removed before the whole area is excavated to the depth of 30 feet at mean low water.

9. The enlarging of the anchorage basin in Rockport Harbor by the removal of boulders.

10. The dredging of a channel in Rock Creek, in Eastham and Orleans.

In addition to the above work, contracts have been let and work will shortly begin on the following projects:—

1. The dredging of the channel and anchorage basin in West Falmouth Harbor.

2. The dredging of about 700,000 cubic yards in Plymouth Harbor to form a channel from the Cow Yard to the wharf of the Plymouth Cordage Company.

3. The construction of a stone jetty from 500 to 700 feet in length at Sesuit Harbor, East Dennis.

**METROPOLITAN PARK COMMISSION.**—*Middlesex Fells Reservation.*—Work of construction of reinforced concrete bridge of 3 arch spans for electric railway at Brooks Road is in progress.

*Mystic River Reservation.*—Work of construction of dam, weirs, tide gates, etc., at Cradock Bridge is in progress.

*Mystic Valley Parkway.*—The work of construction of reinforced concrete bridge over Alewife Brook is in progress.

**HIGHWAY COMMISSION.**—State highways are now under construction in the following cities and towns:—

Adams,	Goshen,	Norton,
Becket,	Harwich,	Orleans,
Billerica,	Holden,	Palmer,
Boston,	Ipswich,	Somerville,
(Washington St., W. Roxbury)	Lee,	Weymouth,
Chilmark,	Marlboro,	
Deerfield,	Methuen,	

**Boston Transit Commission.**— It is expected that the Washington-Street Tunnel work in progress about Nov. 15, 1908, will consist mainly of making the changes in the old Subway in Haymarket Square.

**New York, New Haven & Hartford Railroad.**— It is expected that the work on the new double track drawbridge over Taunton River at Somerset, Mass., described in the last *Bulletin*, will be completed about Nov. 15, 1908.

**Boston Elevated Railway.**— ELEVATED AND SUBWAY CONSTRUCTION.— *Forest Hills Extension.*— All steelwork is erected for this work and the work of protecting the bases of the columns with concrete is now under way.

*South Approach to the Washington-Street Tunnel.*— All work is substantially completed with the exception of installing special work at the Castle Street "Y," which will be in place by November 12th, and entirely complete this portion of work.

*East Cambridge Extension.* — *North Approach to the Washington Street Tunnel.*— Changes necessary for transferring the elevated trains into the Washington-Street tunnel are nearly completed and will be so by November 15th. The masonry incline is complete, track and ballast in place, all steel work is erected and the only work to be completed on November 15th will be the removal of the present temporary platform, and the necessary changes under Haymarket Square which are to be made in conjunction with the Transit Commission.

*East Cambridge Extension, Charles River Bridge.*— Five of the piers for the new bridge across the Charles River are completed, two are nearly completed and three are at the present time in various stages of construction from driving piles to placing concrete. The foundation work will be prosecuted continuously until completion.

*Elevated Division, Extension of Platforms for 8-car Trains.*— The platform extensions sufficient to accommodate 6-car trains are already in place at the greater number of stations, and as rapidly as possible the changes are to be made to accommodate 8-car trains. Foundations for the extensive alterations at City Square Station are complete and within a short time the erection of steel will commence on this work.

**Boston & Albany Railroad.**— WORK IN PROGRESS.— Engine house, machine shop, coal pocket, ash pits, interlocking tower and track changes, Beacon Park, Allston, Mass.



Dredging, pile driving; temporary grain elevator and grain galleries, East Boston, Mass.

Reconstruction of second track trestle bridge at Chelsea Creek, Boston and Chelsea, Mass.

New freight house and grading for new tracks and driveways, East Cambridge Yard.

Abolition of grade crossing west of Hammond Street, Worcester.

New passenger station at Richmond, Mass.

New engine house at Renssler.

New abutments and piers for bridge over Westfield River at Russell, Mass., and for grading new approaches; bridge to pass over tracks to eliminate grade crossing.

New abutment at Bridge No. 196, East Chatham. Bids have been received.

WORK CONTEMPLATED FOR IMMEDIATE CONSTRUCTION.—Superstructure for "Cunard Pier," East Boston, Mass. Bids for general contract and steel frame have been received.

New engine house, West Springfield, Mass. Bids have been received.

Coal pocket at Riverside. Bids have been received.

**Boston :—** CHARLESTOWN.—The Aberthaw Construction Co. is to start on the building of piers in the Navy Yard in order to get some standard tests on the action of sea water on concrete. Associated with them in this is Mr. Herbert L. Sherman of 12 Pearl Street, Cement Chemist. It is proposed to make these tests on various kinds of cement with varying mixtures of concrete. It is proposed to build them part below low tide and part above. Complete records of analysis and tests will be made both by Mr. Sherman and the Navy Department. Suggestions regarding making these tests the most useful possible will be very gladly welcomed by the Aberthaw Co. It is hoped to make these tests the standard on the subject for this locality.

**Jamaica Plain.**—A block of the most modern type, with facade of red face brick and trimmings of rock face brownstone, to contain thirty-six apartments, is being erected on Centre Street, Jamaica Plain, near the Parkway and Jamaica Pond, by Benjamin Fox, Inc., for Mrs. Ella C. Adams.

**Springfield, Mass.**—Bids are being asked for Dec. 4, 1908, for an earth dam on Borden Brook, one of the tributaries of Little River, the new supply of the City of Springfield. Capacity  $2\frac{1}{2}$  billion gallons. This dam will be about 75 feet in height containing about 135,000 cubic yards of earth fill.

The work contemplated is to be done during the season of 1909.

Work has been started during the past ten days on Contract No. 4, laying of the 42-inch steel pipe line between Little River and Springfield. This contract is held by the T. A. Gillespie Co. of New York, price \$428,000.

**Portland, Me.**—On the eight-story reinforced concrete building which the Aberthaw Construction Co. are erecting opposite the Lafayette, described in the last *Bulletin*, the sixth floor was completed on November 5th, two days ahead of schedule. They have been doing better than a story a week on this work. Reinforced concrete frame and floor, mushroom construction; brick walls carried on the frame. The cost of this work is running very satisfactorily, probably considerably below steel frame and fireproof floor construction. F. A. Thompson is the architect.

**Bellows Falls, Vt.**—On November 5th the dam across the Connecticut River, described in the last *Bulletin*, was completed except for gap of 20 feet.

**Concord, Mass.**—The high service extension of the Concord Water Works is now under construction. This system involves the construction of a concrete lined reservoir in earth embankment upon the top of Anurrsnack Hill, and the laying of a considerable amount of 12-inch and 16-inch pipe line and the installation of a two-stage centrifugal pump driven by electric motor and located in the sewage pumping station. Mr. William L. Butcher is resident engineer for Metcalf & Eddy, Consulting Engineers.

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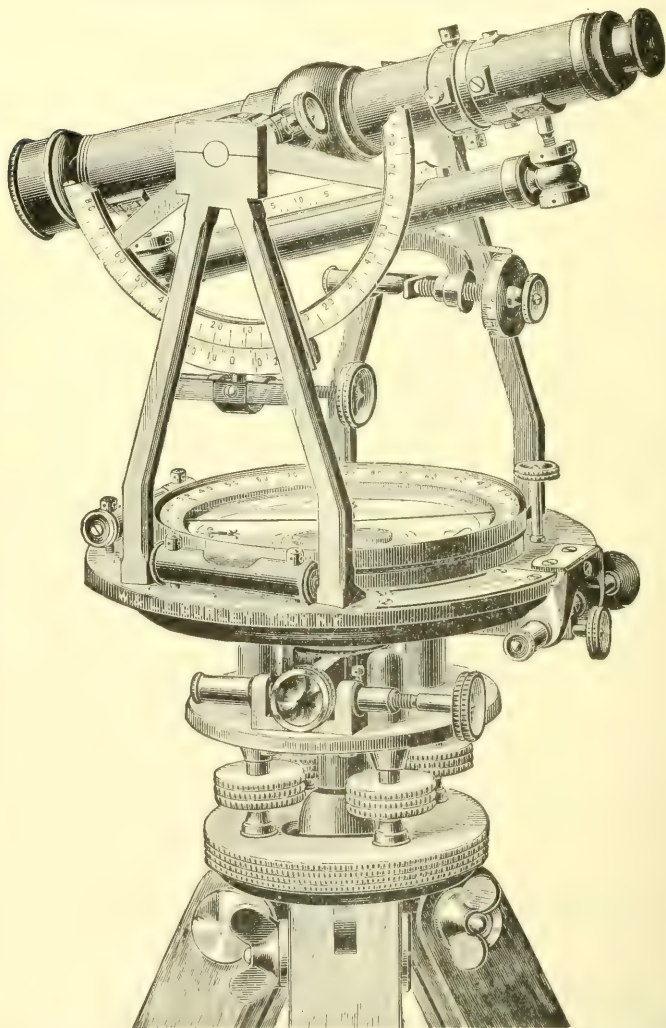
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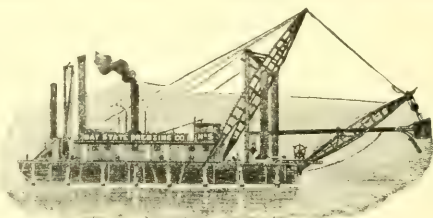
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# **BOSTON SOCIETY OF CIVIL ENGINEERS.**

**ORGANIZED JULY 3, 1848.**

## **MONTHLY BULLETIN.**

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NEW SERIES.

DECEMBER, 1908.

No. 27

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### **REGULAR MEETING.**

A regular meeting of the Boston Society of Civil Engineers will be held on Wednesday, December 16, 1908, at 7.30 P. M., in

CHIPMAN HALL, TREMONT TEMPLE, BOSTON.

Messrs. F. H. Fay, C. M. Spofford and J. C. Moses will present a series of papers entitled "Boylston Street Bridge, Boston, from 1888 to the present time; the destruction and reconstruction of a bridge subjected to locomotive fumes and increasing car loads." The papers will be illustrated by lantern slides.

If time permits it is expected that a general discussion will follow the reading of the papers on the corrosion of iron and steel bridges and methods of prevention. Members having information bearing on the subject are invited to present it.

**BUSINESS OF THE MEETING:** To ballot on the application for membership as announced in this notice.

S. E. TINKHAM, *Secretary.*

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### **JANUARY AND FEBRUARY MEETINGS.**

It is expected that at these meetings the following papers will be presented:—

Jan. 13, 1909. Mr. Desmond FitzGerald will show lantern slides taken in the principal European cities illustrating the Docks and Harbors.

Jan. 27, 1909. A specification for Filing and Indexing Railroad Plans, by H. K. Higgins. The Filing and Indexing Systems of the Board of Water Supply of the City of New York, by Alfred D. Flinn.

Feb. 17, 1909. Mr. H. M. Haven, refrigeration engineer with F. W. Dean and member of the American Society of Mechanical



Engineers and of the American Society of Refrigerating Engineers, will read a paper entitled "Mechanical Refrigeration and Some of its Modern Applications."

### CANDIDATE FOR MEMBERSHIP.

To be balloted on at meeting Dec. 16, 1908.

JOHN GILBERT ANDREWS, Newton, Mass., (b. 1879). Graduate of Dartmouth College, Chandler Scientific Course, 1901, and Thayer School of Civil Engineering, 1902. Resident engineer, Newburyport Bridge, in charge of foundations and approaches; connected with the engineering department of the Boston Bridge Works from Spring of 1904 to Jan. 1, 1905, at which time he was appointed contracting engineer for that company, and now holds that position. Recommended by J. P. Snow, W. G. S. Chamberlain, R. A. Shailer and S. E. Tinkham.

### SOCIETY OF ARTS MEETINGS.

Through the courtesy of the Secretary of the Society of Arts announcement is made of the following meetings of that Society:—

Dec. 17, 1908. Dr. Louis Bell will speak on "Modern Methods of Illumination," and will show some interesting slides from photographs taken abroad, showing especially the artistic effects obtained in foreign cities.

Jan. 13, 1909. Dr. W. H. Walker will speak on "The Corrosion of Iron and Methods of Preventing It." The lecture will be illustrated by experiments.

The meetings are held at 8 o'clock, in Huntington Hall, Massachusetts Institute of Technology. All interested in the subjects are invited to attend.

### MEETING OF THE BOSTON SECTION, AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS.

A meeting of the Boston Section of the American Institute of Electrical Engineers will be held on Wednesday evening, Dec. 16, 1908, at 8 o'clock, in the Auditorium of the Edison Electric Illuminating Company of Boston. This room is on the third floor of the new Edison Building, at 39 Boylston Street, Boston, between Tremont and Washington Streets.

Mr. A. Stein of the National Electric Signal Company will deliver an address entitled "Recent Apparatus for Wireless Telephoning." It will be illustrated by actual apparatus.

A cordial invitation is extended to the members of the Boston Society of Civil Engineers to attend this meeting.

## APPLICATIONS FOR MEMBERSHIP.

The following applications for membership have been received and are now before the Board of Government for approval. Members having information which will assist the government in its consideration of these applications are requested to communicate at once with any member of the Board. Communications will be regarded as confidential and for the use of the Board alone.

### AS MEMBERS.

JOHN FRANCIS MONAGHAN, South Bend, Ind. (b. 1857). Educated in public schools of Warwick and Providence, R. I., and studied engineering under Stephen N. Bourne and B. B. & R. Knight Co. at Pontiac, R. I. At Waltham Bleachery & Dye Works, Waltham, 1872 to 1883, in rebuilding that plant; with Boston Duck Co. at their Bondsville Bleachery & Dye Works from 1883 to 1885, designing and building their new bleachery; from 1884 to 1886, superintendent of this plant and mechanical superintendent of the cotton mill of the Boston Duck Co.; during 1886 with Granger Foundry & Machine Co., Providence, R. I., as head draftsman, designing their various types of machinery for bleaching, dyeing and finishing textile fabrics; from 1886 to 1890 at Lowell Bleachery and Dye Works as master mechanic and mechanical superintendent, and from 1890 to 1900 general superintendent, having complete charge of the output of the plant, and during the years 1890-94 remodeled this plant, installing new system and process of bleaching and finishing, — 3000 H. P. boiler plant, water filtration and purification system for bleaching-water, in 1895 investigating in England, France and Germany in various bleachery and dye works, the feasibility of adopting special lines of textile work to use in this country; from May, 1900, to June, 1901, at Lake Mary, Fla., designing and erecting plant for the Planters Mfg. Co. for the manufacture of cassava starch; from July, 1901, to September, 1902, in Aurora, Ill., as engineer for Aurora Bleachery & Dye Works, designing and building new bleaching and finishing plant, organized their operating force and acted as superintendent for five months until new force could handle the plant; from November, 1902, to May, 1905, with The Textile Finishing Machinery Co., Bleachery Engineers, Providence, R. I., and put into operation for them several bleaching plants which they had installed in the South; June, 1905, to March, 1907, manufacturing textile finishing machinery, and since March, 1907, and at present with The Singer Mfg. Co., South Bend, Ind., as assistant superintendent and in research of mechanical improvements. Recommended by F. W. Farnham, W. F. Sullivan, J. J. Phelan and R. M. Whittet.

FRANK PHOEBUS MORRILL, Malden, Mass. (b. 1883). Entered Rensselaer Polytechnic Institute in 1904, where he attended three years. During summer vacation from June to September, 1905, worked as rodman on the construction of a branch line of the B. & M. R. R. at Greenfield, Mass.; from June to September, 1906, worked as a rodman and inspector on the abolition of grades at Williamstown and North Adams; from June, 1907, to March, 1908, transitman and inspector on double

tracking and separation of grade on the B. & M. R. R.; from March to August, 1908, on North Approach of the Boston Elevated Railway, and now inspector on reconstruction of docks and piers, Boston & Albany Railroad at East Boston. Recommended by William Parker, C. T. Fernald, G. A. Kimball and W. G. S. Chamberlain.

DAVID WILLIAM STRADLING, Somerville, Mass., (b. 1877). Graduated in civil engineering course, Purdue University, in 1905. June, 1896, to June, 1899, rodman and instrument man, county engineer, Indianapolis, Ind.; June 1899, to March, 1901, instrument man on reconstruction, B. & O. S-W. R. R.; March, 1901, to September, 1901, typographer on location, Mo. Pacific Ry.; September, 1901, to June, 1905, student at Purdue University, and during summer vacations served as instrument man for B. & O. R. R. and C. & O. Ry.; June, 1905, to January, 1906, assistant resident engineer on construction, C. C. C. & St. L. Ry.; January, 1906, to January, 1907, assistant engineer on B. & B. renewals, U. P. R. R., Colorado & Wyoming Divisions (1300 miles), January, 1907, to September, 1908, resident engineer, C. N. O. & T. P. Ry. (Cincinnati Southern), in charge of double track and branch line construction and M. of W. (35 miles), and September, 1908, to date, instructor in railroad engineering, Tufts College. Recommended by William Parker, W. T. Barnes, L. G. Morphy and C. D. Bray.

JAMES IRWIN TUCKER, Somerville, Mass., (b. 1877). Graduate of Tufts College, in civil engineering, 1901. May, 1901, to September, 1902, with Pennsylvania Steel Co., as draftsman, transitman and assistant engineer, on 30-million-gallon centrifugal pumping plant; September, 1902, to February, 1903, draftsman, with B. R. & P. Ry. Co., 30 miles of new work, Punxsutawney, Pa.; March, 1903, to September, 1904, partner in general surveying business with County Surveyor, Ashtabula, Ohio, land and railroad surveying and chief draftsman on publication of a new county atlas; September, 1904, to date, instructor in civil engineering at Tufts College. Summer of 1906, Inspector at Grand Central Terminals, New York and summer of 1907, inspector of masonry, third track work, Boston & Albany R. R., South Spencer, Mass. Recommended by F. T. Daniels, C. D. Bray, F. B. Sanborn and William Parker.

ALLEN VAN RENSSELAER, Cambridge (b. 1881). Graduated from the Rensselaer Polytechnic Institute with degree of Civil Engineer in June, 1905. Summer of 1900 in New York State Engineer's Office on survey work as a helper; summer of 1901 in same employ in office estimating; summer of 1902 in same employ in charge of a state highway; summer of 1903 in employ of city engineer, Albany, N. Y., as a paving and sewer inspector; summer of 1904 in state employ in charge of a state highway; June, 1905, to September, 1905, with Frederick A. Snow, realty company, 15 Wall St., New York, as inspection engineer; September, 1905, to February, 1908, with J. G. White & Co., 43 Exchange Place, New York, on railroads in Massachusetts, Indiana, Illinois, Cuba and Pennsylvania, in all capacities from instrument man to locating engineer; February, 1908, to September, 1908, with Sharon Power Co., 43 Exchange Place, New York City, in Vermont on hydro-electric plant as assistant superintendent and resident engineer, and from September, 1908, to date, substitute in Professor Sanborn's course at Tuft's College during his leave of absence for one year. Recommended by L. G. Morphy, W. S. Johnson, F. B. Sanborn, F. S. Bailey and J. R. Worcester.

## MINUTES OF MEETINGS.

### NOVEMBER MEETING OF THE SOCIETY.

Boston, Nov. 18, 1908. — A regular meeting of the Boston Society of Civil Engineers was held at Chipman Hall, Tremont Temple, at 7.35 o'clock p. m., President Joseph R. Worcester in the chair. Sixty-one members and visitors present.

The record of the last meeting was read and approved.

Messrs. Edwin F. Allbright, Henry M. Chadwick, John E. Cunningham, Oliver W. Hartwell, Howard B. Loxterman, Rolf R. Newman and Richard H. Rich were elected members of the Society.

Mr. Frederic H. Fay was elected a Director of the Society for the term expiring in March, 1909.

Mr. C. W. Sherman for the Committee appointed to prepare a memoir of our late associate, Irving T. Farnham, presented and read the report of that Committee.

The Secretary announced the deaths of two members of the Society, G. Edward Sleeper, who died Oct. 25, 1908, and Arthur W. Hunking, who died Nov. 12, 1908.

By vote of the Society, the President was requested to appoint committees to prepare memoirs. The President has appointed as these committees the following members: On memoir of Mr. Sleeper, Mr. Frank O. Whitney; and on memoir of Mr. Hunking, Mr. Frank S. Hart.

An invitation was read from the Secretary of the First New England Conference called by the Governors of these states, inviting members of this Society to be present at the meetings to be held in Boston on November 23 and 24, at which the following topics will be considered: Tree Planting, Protection and Promotion of Supplies of Sea Food, and Highways and their Use.

The report of the Committee on Larger Membership and Club House, presented at the last meeting, was then taken up for discussion, and on motion of Mr. Hodgdon the report was accepted. On motion of Mr. Winslow it was voted to consider the recommendations of the Committee *seriatim*.

It was moved, and duly seconded, that the following recommendation of the Committee in relation to a Club House be adopted: "That the Special Committee on Quarters be instructed that it is the desire of this Society that more convenient quarters be secured, and that said committee take up the active consideration of this subject and report to the Society at the earliest opportunity."



Mr. Thompson moved the following amendment: "The Committee is further instructed to confer with the officials of the New England Water Works Association, the Society of Gas Engineers, the Section of Institute of Electrical Engineers, the Boston Society of Architects, the Boston Architectural Club, and any other societies interested, with a view to combining the quarters of these various societies." After considerable discussion the amendment was adopted.

At this point the President called attention to the by-law requiring the literary exercises "to begin not more than a half hour after the meeting is called to order," and ruled that business must be suspended.

After the literary exercises, the discussion of the report of the Committee on Larger Membership and Club House was resumed, the question being on the adoption of the recommendation of the Committee in relation to a Club House as amended by the meeting.

Mr. E. H. Gowing offered the following motion as an amendment in substitution for the question before the meeting:—

Voted: That the Committee on Larger Membership and Club House be continued and instructed that it is the earnest desire of the Society to acquire a permanent home or Club House at the earliest feasible time; that the Society desires the Committee to confer with the New England Water Works Association, the Architectural Societies, the Gas Engineers, the Railway and Railroad Clubs, and any other association which may be suggested or which, in their opinion, might be desirable to have co-operate with this Society in securing a suitable building; that the Committee carefully investigate the question of financing a building or club house and report at length as soon as possible.

A general discussion followed, and at its conclusion the amendment was adopted. A vote was then taken on the original motion as amended, and it was carried.

The consideration of the second portion of the report of the Committee in relation to larger membership was then taken up, and after considerable discussion it was finally voted, on motion of Professor Breed, that this portion of the report be considered at a special meeting of the Society to be called by the President.

The literary exercises of the meeting consisted of a very interesting and instructive paper by Mr. J. G. Callan of the General Electric Company, entitled, "The Small Steam Turbine, Considered from an Engineering and Commercial View Point." The

paper was very fully illustrated by lantern slides and a 5 K W Curtis single stage horizontal condensing steam turbine was also exhibited.

A discussion followed in which Messrs. F. W. Dean, W. H. Herschel and others took part.

After passing a vote of thanks to Mr. Callan for his valuable paper, the Society adjourned.

S. E. TINKHAM, *Secretary*.

## DECEMBER MEETING OF THE SANITARY SECTION.

A special meeting of the Sanitary Section of the Boston Society of Civil Engineers was held at the Boston City Club on Wednesday, December 2, at 7.30 p. m. Mr. J. Pickering Putnam read a paper entitled, "Some Anomalies in Modern Plumbing Regulations." This paper was illustrated with lantern slides. Mr. David Craig, President of the Master Plumbers' Association, Mr. James C. Coffey, Executive Officer of the Worcester Board of Health, Mr. Charles R. Felton, City Engineer of Brockton, and others took part in the discussion.

Thirty-three members and guests were present.

The next meeting will be held in February.

ROBERT SPURR WESTON, *Clerk*.

## LIST OF MEMBERS.

### ADDITIONS.

EDWARD E. ALBEE . . . . .	101 Milk St., Boston.
EDWIN F. ALLBRIGHT . . . . .	Highland St., Milton, Mass.
J. EARL CUNNINGHAM . . . . .	79 Milk St., Boston.
HAROLD D. JONES . . . . .	161 Devonshire St., Boston.
ALVIN W. KING . . . . .	136 Webster St., West Newton, Mass.
RICHARD H. RICH . . . . .	120 Stanwood St., Roxbury, Mass.
ALBERT T. SPRAGUE, JR., . . . . .	117 Fernwood Ave., Revere, Mass.
HERMAN F. TUCKER . . . . .	Culebra, Canal Zone.
G. STANLEY WHITEHEAD . . . . .	29 Granite St., Cambridge, Mass.

### CHANGES OF ADDRESS.

CHAS. F. BREITZKE . . . . .	108 Chestnut St, Albany, N. Y.
GEORGE E. HOWE . . . . .	Care of C. D. Greenleaf, Wanseon, Ohio.
EDWARD J. JOHNSON . . . . .	314 Lindelle Bldg., Spokane, Wash.
ROBERT A. SHAILER . . . . .	High Falls, N. Y.
HENRY A. SYMONDS . . . . .	100 White St., Waverly, Mass.
JOSEPH F. WILBER . . . . .	42 Franklin St., Somerville, Mass.

### DEATHS.

CHARLES D. ELLIOTT . . . . .	Died Dec. 10, 1908.
ARTHUR W. HUNKING . . . . .	Died Nov. 12, 1908.

## LIBRARY NOTES.

RECENT ADDITIONS TO THE LIBRARY.

### U. S. Government Reports.

Commissioner of Education—Volume 1—1907.

### State Reports.

New York State Water Supply Commission. Report of John R. Freeman on Sacanda and Genesee Water Power development.

Charles River Basin Commission, Annual Report 1907.

### City and Town Reports.

Bangor, Me., Annual Report of Water Board, 1907.

Boston, Mass., Annual Report of Park Commissioners, 1907.

Boston, Mass., Annual Report of Street Department, 1907.

New Bedford, Mass., Annual Report of Water Board, 1907.

Providence, R. I., Quarterly Report of Dept. of Public Works, September, 1908.

### Miscellaneous.

The Plane Table.—W. H. Lovell.

Century Dictionary and Cyclopaedia—Six volumes.

FREDERIC I. WINSLOW, *Librarian*.

## PERSONAL NEWS.

Under this heading it is proposed to publish each month personal news relating to members of the Society. All such items of interest should be sent to the Secretary of the Society by the first day of each month. The co-operation of members is asked to make this column a success, and they are urged to send in notes even when of a personal nature.

Messrs. Hering and Fuller have been retained as consulting engineers on the proposed garbage disposal plant for Milwaukee, Wis.

\* \* \*

Mr. J. Parker Snow has been appointed First Vice-President of the American Railway Engineering and Maintenance-of-Way Association.

\* \* \*

Mr. John R. Freeman and Mr. Frederic P. Stearns have been appointed to act as consulting engineers in connection with the improvement of the Water supply of Baltimore, Md.

## NEW ENGINEERING WORK.

(Under this head the Excursion Committee proposes to present each month a brief résumé of engineering work in progress in New England, as far as such information is readily obtainable. The assistance of members is desired, and items of interest will be gladly received. Such items are intended to include not only works of exceptional magnitude or containing novel features, but also engineering construction work of all kinds and all degrees of magnitude. Notes should be in the hands of the Committee not later than the 2nd Wednesday of each month. The thanks of the Committee are due to the members who have furnished data for the Bulletin.—R. W. LORD, Secretary, Excursion Committee, 1 Ashburton Place, Boston.)

**Commonwealth of Massachusetts.**—**METROPOLITAN PARK COMMISSION.**—*Middlesex Fells Reservation.*—Work of construction of reinforced concrete bridge of 3-arch spans for electric railway at Brooks Road is in progress.

*Mystic River Reservation.*—Work of construction of dam, weirs, tide gates, etc. at Cradock Bridge is in progress.

**CHARLES RIVER BASIN COMMISSION.**—*Work in Progress at the Dam and Lock.*—At the Lock the heating apparatus in the lock-gates to prevent ice forming is in operation, and the wiring for the electrical control in the tower of the lower lock-gate house is being installed.

*At the Sluices.*—The elevation of the water in the Basin is being maintained at the required elevation. Filling for the Dam is being deposited from required excavations in the Basin and the Cambridge canals.

*Boston Embankment and Boston Marginal Conduit.*—The conduit is now in operation from the Dam to Dartmouth Street, and the overflows between Dartmouth Street and the Fens are connected with the conduit, and the permanent overflows are in operation between those points.

*Cambridge Marginal Conduit.*—The Cambridge Marginal Conduit is entirely finished and in operation.

**HIGHWAY COMMISSION.**—State highways are now under construction in the following cities and towns:—

Becket,	Harwich,	Norton,
Billerica,	Holden,	Oxford,
Boston (West Roxbury),	Lee,	Weymouth,
Dighton,	Marlboro,	

**Boston Transit Commission.**—It is expected that the Washington Street Tunnel work in progress about Dec. 15, 1908, will consist mainly of making the changes in the old Subway at Haymarket Square.



**Boston Elevated Railway.**—ELEVATED AND SUBWAY CONSTRUCTION. — *Extension for 8-Car Platforms.*—With the exception of City Square most of the steelwork for this work is erected, and changes are under way at Dudley Street to accommodate the traffic on the extension to Forest Hills and provide for additional platforms for the surface cars on both loops. At City Square station preliminary work has begun upon the final changes for straightening the line and remodeling the station.

*East Cambridge Extension.*—Work is in progress on the foundations for piers 3 and 9 on the Charles River Bridge. The work at the North Station has been temporarily suspended for the winter.

**Boston.**—CHARLESTOWN.—The Aberthaw Construction Company will start test piers to determine the action of sea water on concrete at the Charleston Navy Yard. Have had somewhat extensive correspondence with various engineers and the Government on this matter, and want any suggestions regarding the making of the piers as satisfactory as possible. In brief, it is proposed to make specimens of 1:1:2 and 1:2:4 and 1:3:6 mixtures, mixed dry, plastic and wet. The piers are to be 16 inches square and 16 feet long; the tops to be permanently dry, bottoms permanently wet. In the upper half a 3-inch hole will be cored and the top sealed. From time to time this will be opened to see if water has percolated through the concrete to the hole. Different cements will be used having the following properties: High alumina, low alumina, iron ore cement, white Portland cement free from iron, slag Portland cement. One specimen will be mixed much more thoroughly than in ordinary practice; one with sea water; one with 1-10 part hydrated lime; one with Sylvester solution; one with 5 % by weight of the cement of clay.

**Bellows Falls, Vt.**—The dam across the Connecticut River at Bellows Falls has been completed.

**Portland, Me.**—The roof is now on the new 8-story Baxter Building which the Aberthaw Construction Company are building for Hon. J. P. Baxter, opposite the Lafayette. This work was started the latter part of September. Brick walls are carried on concrete frame up to the seventh story.

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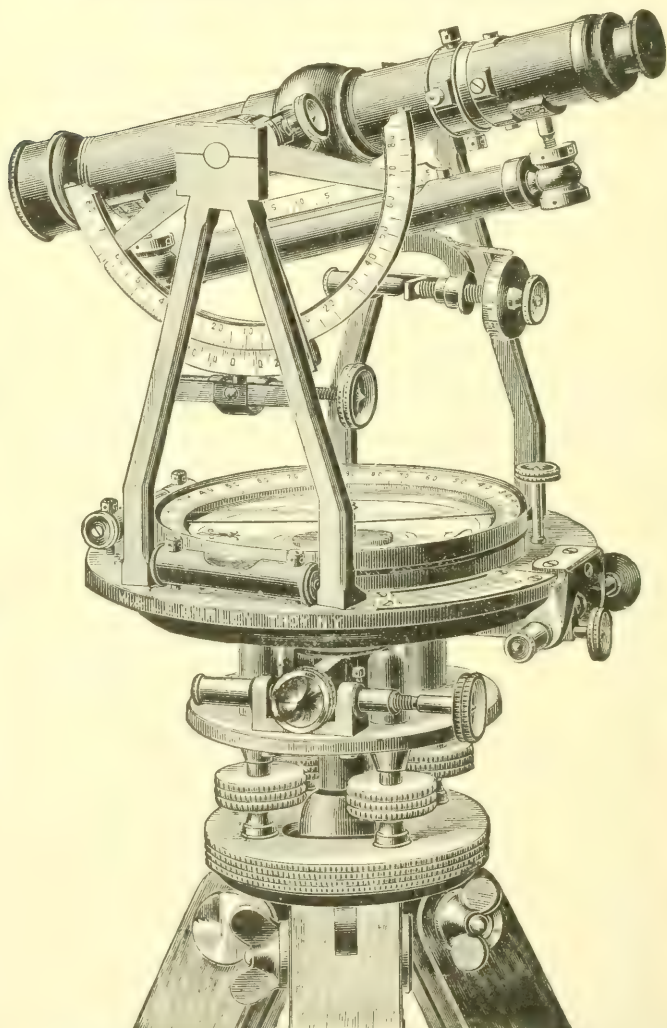
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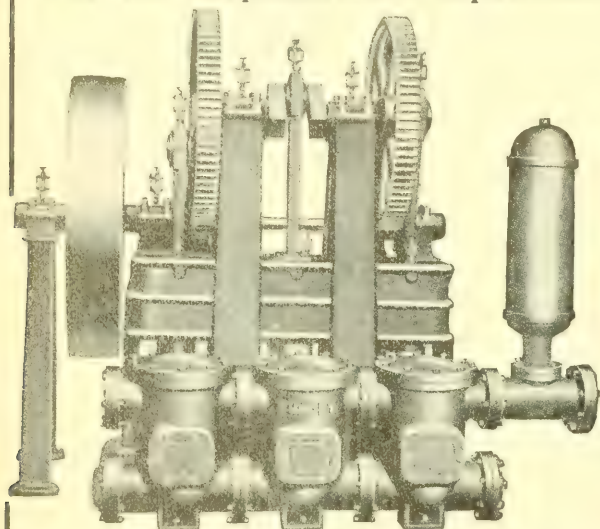
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**BOSTON SOCIETY OF CIVIL ENGINEERS.**

**ORGANIZED JULY 3, 1848.**

# MONTHLY BULLETIN.

NEW SERIES.

JANUARY, 1909.

No. 28

## REGULAR MEETING.

A regular meeting of the Boston Society of Civil Engineers will be held on Wednesday, Jan. 27, 1909, at 7.30 p. m., in

CHIPMAN HALL, TREMONT TEMPLE, BOSTON.

The following papers will be presented:—

A specification for Filing and Indexing Railroad Plans, by H. K. Higgins.

The Filing and Indexing Systems of the Board of Water Supply of the City of New York, by Alfred D. Flinn. A brief outline of the works of the Board will also be given, illustrated by lantern slides.

The System of Indexing Plans used by the Boston Elevated Railway Co. in the Department of Elevated and Subway Construction, by Herbert C. Hartwell.

**BUSINESS OF THE MEETING:** To ballot on the applications for membership as announced in this notice.

To choose a Committee of five to nominate officers for the ensuing year.

S. E. TINKHAM, *Secretary.*

## EXCURSION.

Through the courtesy of the General Electric Company there will be an excursion to the Lynn works of that Company on Wednesday, January 27th.

A special car (electric) will leave corner of Portland and Hanover Streets at 1.15 p. m. *sharp*. Party will in returning reach Boston probably about 5 or 5.30 p. m. Fare for round trip about thirty cents.

The Lynn works of the General Electric Company are very large in extent, of modern construction and afford an excellent opportunity to inspect certain features of the output of this Company, including the Grey Iron and Steel Foundries, the Curtis Steam Turbine, Punch Press and Small Motor Departments and General Machine Shop.

## EXCURSION COMMITTEE.

February Meetings, see page 2

Preliminary Announcement of Annual Meeting, see page 2.



## FEBRUARY MEETING.

At the regular meeting to be held on Feb. 17, 1909, Mr. Henry M. Haven, refrigeration engineer with F. W. Dean and member of the American Society of Mechanical Engineers and of the American Society of Refrigerating Engineers, will read a paper entitled "Mechanical Refrigeration and Some of its Modern Applications."

## INFORMAL MEETING, FEB. 10, 1909.

**MUNICIPAL ENGINEERS' MEETING:** This meeting is to discuss municipal problems. The topics for the evening will be:—

Location of Pipes and Conduits of Public Service Corporations, by Lewis M. Hastings, City Engineer, Cambridge.

Method of Obtaining and Preparing Transfers of Property for Use in Assessors' Department, by Arthur Bartlett, Assistant Engineer, Lowell.

Preparation of Plans for the Assessment of Betterments in Boston and the Laws Governing the Same, by Frank O. Whitney, Chief of Surveying Division, Street Laying Out and Engineering Departments, Boston.

The meeting will be held at 7.45 o'clock in the Society's Library, 715 Tremont Temple.

It is hoped there will be a good attendance of City Engineers and their assistants, whether they are members of the Society or not.

So few responses have been received in answer to the announcement made in the *November Bulletin* in relation to informal meetings, that the attention of members is again called to the offer to send special postal card notices of these informal meetings to all who request them. The Secretary again asks all members who desire these notices sent regularly to notify him. It has been suggested that in an office where there are a number of members located, a single notice sent to that office and posted in a conspicuous place would reach all of its members.

## ANNUAL MEETING.

The Board of Government has decided to follow the suggestion of the Committee on Larger Membership which was approved by the Society at the special meeting of December 11th, and to combine the Annual Dinner with the Annual Meeting, making an

all-day event. Arrangements have been made with the Boston City Club to provide the necessary refreshments and space for our meetings at its rooms, 9 Beacon Street, Boston. The meeting will occur on March 17, 1909, and further details of the arrangements will be announced later, but it may be stated now that the plans embrace a business meeting in the forenoon, a dinner in the afternoon, and a smoker in the evening. It is hoped that the occasion will attract a large attendance of our non-resident membership.

### SOCIETY OF ARTS MEETING.

Through the courtesy of the Secretary of the Society of Arts announcement is made of the following meeting of that Society:—

Jan. 28, 1909. Dr. Charles P. Steinmetz, Professor of Electrical Engineering at Union University, will speak on "The Future of Electricity."

The meeting will be held at 8 o'clock, in Huntington Hall, Massachusetts Institute of Technology. All interested in the subject are invited to attend.

## MINUTES OF MEETINGS.

### DECEMBER MEETINGS OF THE SOCIETY.

BOSTON, DEC. 11, 1908.—A special meeting of the Boston Society of Civil Engineers was held at the Boston City Club, 9 Beacon Street, Boston, at 7.45 o'clock P. M. Vice-President Henry F. Bryant in the chair; 51 members present.

The Chairman announced that the meeting had been called by the President in accordance with a vote of the Society passed at the last meeting, to consider the suggestions in relation to a larger membership made in the report of the Committee on Larger Membership and Club House presented at the October meeting, and to act upon the same or any modifications thereof.

The six suggestions offered in the report were then fully and freely discussed. The Secretary read a communication from Mr. George B. Francis and other members of the Society in New York City, from Mr. Laurence Bradford, from Mr. Edwin F. Dwelley and from Mr. Andrew D. Fuller, bearing on the subject under discussion. The last two communications were by vote referred to the Committee on Larger Membership and Club House.

Action was taken on the six suggestions as follows :—

Suggestion 1. Establishment of a Bureau of Registration. Voted: That it is the sense of this meeting that a bureau of registration for members seeking employment or a change of position should be established by this Society and that the Committee on Larger Membership and Club House be instructed to formulate a plan for the establishment of such a bureau and report the same to the Society.

Suggestion 2. Additional Informal Meetings. After an explanation of what the Board of Government is doing in relation to these meetings, no action was taken.

Suggestion 3. Increased Circulation of the *Bulletin*. It was voted that the Board of Government be requested to send the *Bulletin gratis* to such of the larger engineering offices as it deems expedient.

Suggestion 4. Publication of the Proceedings and Papers of the Society in a Journal of its own. After a very free discussion of this suggestion, it was voted to lay the matter on the table.

Suggestion 5. Formation of Additional Sections of the Society. The following resolution was adopted: Resolved, that this meeting favors the formation of additional sections and respectfully suggests to the Board of Government the possibility of creating more active interest in the Society by the appointment of certain committees to investigate and report to it upon the feasibility of forming additional sections.

Suggestion 6. Annual Meeting to be made more of a function. Voted: That the Society approves the recommendation of the Committee and that the matter of arranging for the Annual Meeting be referred to the Board of Government with full powers.

Adjourned.

S. E. TINKHAM, *Secretary*.

BOSTON, DEC. 16, 1908. — A regular meeting of the Boston Society of Civil Engineers was held at Chipman Hall, Tremont Temple, at 7.40 o'clock P. M., President Joseph R. Worcester in the chair; 110 members and visitors present.

The records of the last regular and the special meeting of Dec. 11, 1908, were read and approved.

Mr. John G. Andrews was elected a member of the Society.

The Secretary announced the death of Charles D. Elliot, a member of the Society, which occurred Dec. 10, 1908, and by vote

the President was requested to appoint a committee to prepare a memoir. The President has appointed as that committee Messrs. G. A. Kimball, J. A. Holmes and C. A. Pearson.

The Secretary reported for the Board of Government that it had appointed Mr. H. K. Barrows a member of the Committee on Excursions in place of Mr. E. M. Blake resigned, and Mr. E. S. Larned a member of the Committee on Larger Membership and Club House in place of Mr. C. R. Gow resigned.

A series of papers was then presented and read under the general title "Boylston Street Bridge, Boston, from 1888 to the present time; the destruction and reconstruction of a bridge subjected to locomotive fumes and increasing car loads."

Mr. Frederic H. Fay described the design and construction of the original bridge built in 1888; Prof. Chas. M. Spofford followed with an account of the strengthening of the bridge in 1907 for the Boston Elevated Railway Company; Mr. Fay then described the rebuilding of the bridge in 1908 for street traffic, and Mr. John C. Moses gave an account of the erection work in connection with the rebuilding of both portions.

All the papers were fully illustrated with lantern slides. A general discussion followed.

Adjourned.

S. E. TINKHAM, *Secretary*.

## CANDIDATES FOR MEMBERSHIP.

To be balloted on at meeting Jan. 27, 1909.

JOHN FRANCIS MONAGHAN, South Bend, Ind. (b. 1857). Educated in public schools of Warwick and Providence, R. I., and studied engineering under Stephen N. Bourne and B. B. & R. Knight Co at Pontiac, R. I. At Waltham Bleachery & Dye Works, Waltham, 1872 to 1883, in rebuilding that plant; with Boston Duck Co. at their Bondsville Bleachery & Dye Works from 1883 to 1885, designing and building their new bleachery; from 1884 to 1886, superintendent of this plant and mechanical superintendent of the cotton mill of the Boston Duck Co.; during 1886 with Granger Foundry & Machine Co., Providence, R. I., as head draftsman, designing their various types of machinery for bleaching, dyeing and finishing textile fabrics; from 1886 to 1890 at Lowell Bleachery and Dye Works as master mechanic and mechanical superintendent, and from 1890 to 1900 general superintendent, having complete charge of the output of the plant, and during the years 1890-94 remodeled this plant, installing new system and process of bleaching and finishing,—3000 H. P. boiler plant, water filtration and purification system for bleaching—

water, in 1895 investigating in England, France and Germany in various bleachery and dye works, the feasibility of adopting special lines of textile work to use in this country; from May, 1900, to June, 1901, at Lake Mary, Fla., designing and erecting plant for the Planters Mfg. Co. for the manufacture of cassava starch; from July, 1901, to September, 1902, in Aurora, Ill., as engineer for Aurora Bleachery & Dye Works, designing and building new bleaching and finishing plant, organized their operating force and acted as superintendent for five months until new force could handle the plant; from November, 1902, to May, 1905, with The Textile Finishing Machinery Co., Bleachery Engineers, Providence, R. I., and put into operation for them several bleaching plants which they had installed in the South; June, 1905, to March, 1907, manufacturing textile finishing machinery, and since March, 1907, and at present with The Singer Mfg. Co., South Bend, Ind., as assistant superintendent and in research of mechanical improvements. Recommended by F. W. Farnham, W. F. Sullivan, J. J. Phelan and R. M. Whittet.

FRANK PHOEBUS MORRILL, Malden, Mass. (b. 1883). Entered Rensselaer Polytechnic Institute in 1904, where he attended three years. During summer vacation from June to September, 1905, worked as rodman on the construction of a branch line of the B. & M. R. R. at Greenfield, Mass.; from June to September, 1906, worked as a rodman and inspector on the abolition of grades at Williamstown and North Adams; from June, 1907, to March, 1908, transitman and inspector on double tracking and separation of grade on the B. & M. R. R.; from March to August, 1908, on North Approach of the Boston Elevated Railway, and now inspector on reconstruction of docks and piers, Boston & Albany Railroad at East Boston. Recommended by William Parker, C. T. Fernald, G. A. Kimball and W. G. S. Chamberlain.

DAVID WILLIAM STRADLING, Somerville, Mass., (b. 1877). Graduated in civil engineering course, Purdue University, in 1905. June, 1896, to June, 1899, rodman and instrument man, county engineer, Indianapolis, Ind; June 1899, to March, 1901, instrument man on reconstruction, B. & O. S-W. R. R.; March, 1901, to September, 1901, typographer on location, Mo. Pacific Ry.; September, 1901, to June, 1905, student at Purdue University, and during summer vacations served as instrument man for B. & O. R. R. and C. & O. Ry.; June, 1905, to January, 1906, assistant resident engineer on construction, C. C. C. & St. L. Ry.; January, 1906, to January, 1907, assistant engineer on B. & B. renewals, U. P. R. R., Colorado & Wyoming Divisions (1300 miles), January, 1907, to September, 1908, resident engineer, C. N. O. & T. P. Ry. (Cincinnati Southern), in charge of double track and branch line construction and M. of W. (35 miles), and September, 1908, to date, instructor in railroad engineering, Tufts College. Recommended by William Parker, W. T. Barnes, L. G. Morphy and C. D. Bray.

JAMES IRWIN TUCKER, Somerville, Mass., (b. 1877). Graduate of Tufts College, in civil engineering, 1901. May, 1901, to September, 1902, with Pennsylvania Steel Co., as draftsman, transitman and assistant engineer, on 30-million-gallon centrifugal pumping plant: September, 1902, to



February, 1903, draftsman, with B. R. & P. Ry. Co., 30 miles of new work, Punxsutawney, Pa.; March, 1903, to September, 1904, partner in general surveying business with County Surveyor, Ashtabula, Ohio, land and railroad surveying and chief draftsman on publication of a new county atlas; September, 1904, to date, instructor in civil engineering at Tufts College. Summer of 1906, Inspector at Grand Central Terminals, New York and summer of 1907, inspector of masonry, third track work, Boston & Albany R. R., South Spencer, Mass. Recommended by F. T. Daniels, C. D. Bray, F. B. Sanborn and William Parker.

ALLEN VAN RENNELAER, Cambridge (b. 1881). Graduated from the Rensselaer Polytechnic Institute with degree of Civil Engineer in June, 1905. Summer of 1900 in New York State Engineer's Office on survey work as a helper; summer of 1901 in same employ in office estimating; summer of 1902 in same employ in charge of a state highway; summer of 1903 in employ of city engineer, Albany, N. Y., as a paving and sewer inspector; summer of 1904 in state employ in charge of a state highway; June, 1905, to September, 1905, with Frederick A. Snow, realty company, 15 Wall St., New York, as inspection engineer; September, 1905, to February, 1908, with J. G. White & Co., 43 Exchange Place, New York, on railroads in Massachusetts, Indiana, Illinois, Cuba and Pennsylvania, in all capacities from instrument man to locating engineer; February, 1908, to September, 1908, with Sharon Power Co., 43 Exchange Place, New York City, in Vermont on hydro-electric plant as assistant superintendent and resident engineer, and from September, 1908, to date, substitute in Professor Sanborn's course at Tuft's College during his leave of absence for one year. Recommended by L. G. Morphy, W. S. Johnson, F. B. Sanborn, F. S. Bailey and J. R. Worcester.

## APPLICATIONS FOR MEMBERSHIP.

The following applications for membership have been received and are now before the Board of Government for approval. Members having information which will assist the government in its consideration of these applications are requested to communicate at once with any member of the Board. Communications will be regarded as confidential and for the use of the Board alone.

### AS MEMBERS.

FRED R. CHARNOCK, Medford, Mass., (b. 1862). Graduated from the Boston English High School in 1878 and took post graduate course in 1879. With City Engineer of Boston from 1879 to 1882; with Adams & Muzzey on sewer work at Keene, N. H.; on shallow flowage, Basin No. 2, Boston Water Works, fall of 1883 and early part of 1884; in City Architect's Office, Boston, from 1884 to 1890, having charge of foundation work for the Public Library and was superintendent on several other buildings; with Boston Steel & Iron Co. for fifteen years and at present is City Engineer of Medford. Recommended by F. I. Winslow, S. E. Tinkham, F. W. Hodgdon and H. B. Wood.

EDWARD AARON HASKELL, Newton, Mass. (b. 1864). Two years at Mass. Institute of Technology. Nearly two years with A. H. French, C. E.; and continuous service thereafter with B. & A. R. R., seven and one-half years in engineering department, thirteen years as roadmaster and one year as division engineer in charge of maintenance of tracks, bridges and buildings; now division engineer, B. & A. R. R., N. Y. C. & H. R. R. R. Co., lessee. Recommended by Walter Shepard, William Parker, W. G. S. Chamberlain and A. H. French.

FRANK ALWYN MARSTON, Boston (b. 1885). Graduated from the Worcester Polytechnic Institute in civil engineering course in June, 1907. From June to December, 1907, was employed by L. D. Thorpe, C. E., as assistant engineer on the design and construction of the Norwood, Mass. sewage disposal plant and pipe lines; December, 1907, entered the employ of Metcalf & Eddy, consulting engineers, with them he has been engaged on work for Louisville, Ky. sewerage system, and on water works for Concord, Mass., Livermore Falls, Me., and other places. Recommended by Leonard Metcalf, C. W. Sherman, R. S. Weston and W. T. Barnes.

RALPH I. MCCORKINDALE, Somerville, Mass. (b. 1882). Educated at Rensselaer Polytechnic Institute, 1901 to 1905 inclusive. June 15 to Sept. 15, 1902, sub-inspector on concrete, U. S. Naval Coal Depot, Bradford, R. I.; July 1 to Oct. 1, 1905, concrete inspector, Holyoke Water Power Co.; Oct. 1, 1905, to June 25, 1906, inspector, Penn. Terminals, New York; June 25, 1906, to June 1, 1908, employed first as electrical estimator of the Thompson-Starrett Co., general contractors, New York City, and later as assistant mechanical engineer of the same company and in charge of electrical estimating and draughting; and since July 15, 1908, Steel Inspector for J. R. Worcester & Co., Boston. Recommended by J. R. Worcester, G. H. Brazer, E. E. Pettee and F. L. Murray.

#### LIST OF MEMBERS.

##### ADDITIONS.

JOHN G. ANDREWS . . . . .	47 Winter St., Boston.
HENRY M. CHADWICK . . . . .	23 Ivy Road, Malden, Mass.
OLIVER W. HARTWELL . . . . .	77 Munroe St., Somerville, Mass.
ROLF R. NEWMAN . . . . .	14 Beacon St., Boston.
RALPH E. RICE . . . . .	4 Frederick Terrace, Dorchester, Mass.
JAMES E. STONE . . . . .	53 State St., Room 1105, Boston.

##### CHANGES OF ADDRESS.

T. H. BARNES . . . . .	Puerto Barrios, Gautemala.
N. S. BROCK . . . . .	2 Walnut St., Boston.
E. L. CORTHELL, Caixa 58, Rio Grande, Rio Grande do Sul, Brazil, S. A.	
JOHN H. GREGORY . . . . .	170 Broadway, New York, N. Y.
JOSEPH H. KIMBALL . . . . .	605 Equitable Bldg., Louisville, Ky.
ALVIN W. KING . . . . .	842 Monadnock Block, Chicago, Ill.
F. B. LOCKE . . . . .	North Adams, Mass.
WILLIAM NELSON . . . . .	Binghamton, N. Y.

## LIBRARY NOTES.

### BOOK REVIEWS.

*Laboratory Notes on Industrial Water Analysis. A Survey Course for Engineers.* By Ellen H. Richards, Instructor in Sanitary Chemistry, Massachusetts Institute of Technology. 8 vo., 111 + 49 pages. Cloth, 50 cents. New York. John Wiley & Sons. 1908.

[Donated by the Publishers.]

This little book contains much which will be of value to engineers who have occasion to use water for steam, for dyeing and textile manufacturing, for brewing, for chemical purposes, etc. The book is not intended for chemists, but, as the title indicates, is a survey course for engineers, and the ordinary analytical processes to be found in text-books are omitted. The book treats of scale-forming waters, of iron and other minerals which cause trouble, of alkalinity and hardness, and of the action of water on metals, enough being given on each of these subjects to enable the engineer with a very limited knowledge of chemistry to make the determinations necessary to show roughly the fitness of a water for various mechanical uses.

WILLIAM S. JOHNSON.

### RECENT ADDITIONS TO THE LIBRARY.

#### U. S. Government Reports.

Panama Canal Commission — Annual Report 1907-08.

#### State Reports.

Indiana, Annual Report Board of Health, 1907.

Massachusetts, Annual Report Board of Health, 1907.

New York, Annual Report Public Service Commission, 1907.

#### Miscellaneous.

National Board of Fire Underwriters. Reports on Springfield, Ill., Brockton, Lawrence, Lowell and Lynn, Mass., Binghampton and Oswego, N. Y., Toledo, O., Erie and Reading, Pa., Newport, Pawtucket and Central Falls, R. I.

Ten back volumes of the Municipal Journal and Engineer have been acquired and bound, covering from 1903 to 1908.

FREDERIC I. WINSLOW, *Librarian.*

## NEW ENGINEERING WORK.

(Under this head the Excursion Committee proposes to present each month a brief résumé of engineering work in progress in New England, as far as such information is readily obtainable. The assistance of members is desired, and items of interest will be gladly received. Such items are intended to include not only works of exceptional magnitude or containing novel features, but also engineering construction work of all kinds and all degrees of magnitude. Notes should be in the hands of the Committee not later than the 2nd Wednesday of each month. The thanks of the Committee are due to the members who have furnished data for the Bulletin.—R. W. LOUD, Secretary, Excursion Committee, 1 Ashburton Place, Boston.)

**Commonwealth of Massachusetts.**—**CHARLES RIVER BASIN COMMISSION.**—*Work in Progress at the Dam and Lock.* The Lock is being successfully operated, and the wiring for the electrical control is being transferred to the permanent location in the tower of the lower lock-gate house.

Filling for the Dam is in progress between the Lock and the sluices, and at the sluices everything is in operating condition.

*Boston Embankment and Boston Marginal Conduit.*—

All work, except filling, is suspended for the winter. The marginal conduit is in operation for its entire length, and the permanent overflows are in operation.

**HARBOR AND LAND COMMISSION.**—The work of clearing the shoals from sections Nos. 1 and 2 of the anchorage basin in Boston Harbor is still in progress.

In Dorchester Bay, between Savin Hill and Commercial Point, the dredging of an area to a depth of 9 feet at mean low water, to enlarge the anchorage basin for yachts, is still in progress.

At Sesuit Harbor, East Dennis, work has just been commenced on the construction of a stone jetty.

The dredging of the channel in East Bay, Osterville, is in progress, and the enlarging of the entrance to West Bay, at Osterville, is now nearly completed.

The building of a pile wharf at Penikese Island is still in progress. All the piles are driven, and it is expected to complete the wharf some time next week.

Work is still in progress on the dredging of a boat harbor in Deacons Pond in Falmouth.

**Boston Elevated Railway.**—**ELEVATED AND SUBWAY CONSTRUCTION.**—*Station Alterations.*—Placing of shoring and erection of steelwork has been begun at City Square for the extensive alterations to the elevated structure. The track alinement is



to be straightened and the present 6-car intertrack station is to be replaced by two 8-car side track platforms.

Alterations to the Dudley Street Terminal are in progress, the east (elevated) surface loop already occupying its new location. The Egleston Square Station is entirely completed and erection of steelwork for the Forest Hills Station should begin within a month.

Foundations are under construction at the South Station for proposed changes to the entrance and exit stairs on the westerly side of Atlantic Avenue and the enlarged exit into the South Station. Track system is being installed on the third track, Washington Street, near Dudley Street, and the necessary special work installed at this point to permit operation on the Forest Hills Extension.

*Charles River Bridge.*—Construction work on the foundation of piers 3 and 5 for the new bridge are in progress. 60-inch castiron outfall pipes have been laid through pier 3 for the Boston Marginal Conduit. Stonework is in progress on pier 9.

**Boston & Albany Railroad.**—WORK IN PROGRESS.

Engine house, machine shop, coal pocket, ash pits, interlocking tower and track changes, nearly completed and practically ready for use, Beacon Park, Allston.

Dredging, pile driving; temporary grain elevator and grain galleries, East Boston, Mass.

Abolition of grade crossings west of Hammond Street, Worcester.

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New Engine House, West Springfield, Mass. Bids have been received.

New abutments and piers for bridge over Westfield River at Russell, Mass., and for grading new approaches; bridge to pass over tracks to eliminate grade crossing. Masonry nearly finished.

New abutment at Bridge No. 196, East Chatham.

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Superstructure for "Cunard Pier" East Boston, Mass. Bids for general contract and steel frame has been awarded.

**Boston Transit Commission.**—It is expected that the Washington-Street Tunnel work in progress about Jan. 15, 1909, will consist mainly of making the changes in the old Subway at Haymarket Square.



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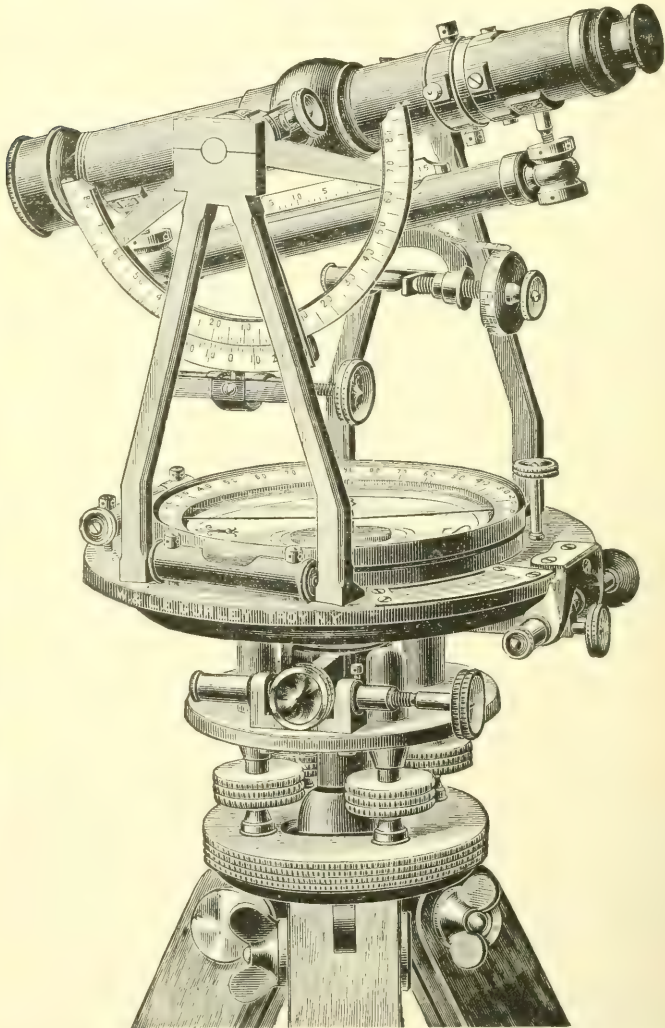
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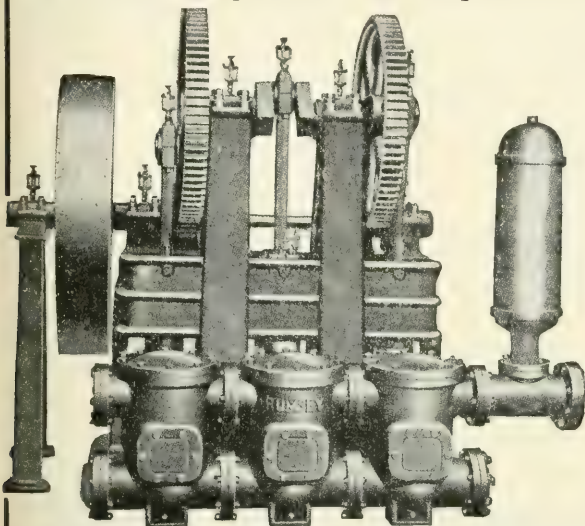
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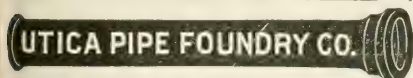
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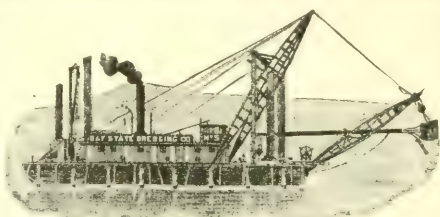
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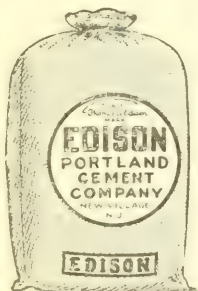
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# MONTHLY BULLETIN.

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NEW SERIES.

FEBRUARY, 1909.

No. 29

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## REGULAR MEETING.

A regular meeting of the Boston Society of Civil Engineers will be held on Wednesday, February 17, 1909, at 7.30 P. M., in

CHIPMAN HALL, TREMONT TEMPLE, BOSTON.

Mr. Henry M. Haven, refrigeration engineer with F. W. Dean and member of the American Society of Mechanical Engineers and of the American Society of Refrigerating Engineers, will read a paper entitled "Mechanical Refrigeration and Some of its Modern Applications." The paper will be illustrated by lantern slides.

**BUSINESS OF THE MEETING:** To ballot on the applications for membership as announced in this notice.

S. E. TINKHAM, *Secretary*.

## ANNUAL MEETING.

As announced in the last Bulletin, the Annual Meeting and the Annual Dinner this year will be held on the same day, March 17, 1909, and with the Smoker in the evening will be an all-day event.

The meetings will all be held at the Boston City Club, 9 Beacon Street, Boston, where ample accommodations have been secured and arrangements have been made by which the Society functions will be entirely independent of the general use of the Club House by its members.

The Committee is able to give at the present time the general features of the program; further details will be announced in the March Bulletin.



**Business Meeting.** The annual meeting will be held at 11 o'clock A. M., for the hearing of the annual reports and the election of officers. The polls for letter-ballots will close at 12 o'clock M. A short address will be made by the retiring President.

**Annual Dinner.** The annual dinner will be served at 2 o'clock P. M., in the Auditorium, for which the price for members and guests will be \$2. per plate.

Mr. George B. Francis will read a paper giving the history and a description of the Railroad Terminals at Providence, R. I., including the extensive tunnel work recently completed. The paper will be very fully illustrated by lantern slides.

**Smoker.** In the evening an informal Smoker will be held at 7 o'clock in the Auditorium, when a better opportunity will be had for our members to meet socially than has been possible at former annual gatherings. The membership has increased so largely in recent years that many of the younger members are not known to the older members, as there is rarely time at the regular meetings for social greetings, but this smoker will afford an ideal opportunity for the making of new, and the renewal of old acquaintances and it will give the local members a special occasion to welcome the non-resident members. Light refreshments and music may be expected.

Members may invite friends to the Smoker, but admission will be strictly by ticket. Tickets for members will be free; a charge, however, of \$1. will be made for guest tickets.

### SANITARY SECTION MEETING.

The annual meeting of the Sanitary Section will be held at the Boston City Club on Wednesday, March 3, at 7.30 o'clock. The subject for discussion will be "The Volume of Sewage in Sewers designed according to the Separate System." Mr. William S. Johnson will open the discussion. The meeting will be preceded by a dinner at 6 o'clock. The price of the dinner tickets will be \$1.25.

### INFORMAL MEETING, MARCH 10, 1909

An informal meeting will be held on Wednesday evening, March 10, 1909, at 7.45 o'clock in the Society's Library, 715 Tremont Temple. Mr. Austin B. Fletcher will give an account of the First International Road Congress.

## APRIL MEETING.

At the regular meeting of the Society to be held on Wednesday evening, April 21, 1909, Mr. E. R. B. Allardice will read a paper entitled "Reforestation of the Marginal Lands of the Wachusett Reservoir of the Metropolitan Water Works."

## MEMBERSHIP CARDS.

The membership cards for 1909 are now ready for distribution and one will be mailed to any member on application to the Secretary.

## MEETING OF THE BOSTON SECTION, AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS.

A meeting of the Boston Section of the American Institute of Electrical Engineers will be held on Wednesday evening, Feb. 17, 1909, at 8 o'clock, in the Auditorium of the Edison Electric Illuminating Company of Boston. This room is on the third floor of the new Edison Building, at 39 Boylston Street, Boston, between Tremont and Washington Streets.

Prof. Elihu Thomson will present his paper, "Conditions Affecting Stability of Electric Lighting Circuits," which was read in New York at the January meeting.

A cordial invitation is extended to the members of the Boston Society of Civil Engineers to attend this meeting.

## SOCIETY OF ARTS MEETING.

Through the courtesy of the Secretary of the Society of Arts announcement is made of the following meeting of that Society:—

Feb. 27, 1909.—Prof. Charles E. Lucke, who is at the head of the mechanical engineering department of Columbia University, will lecture on "Gas Power." His lecture will cover the whole field in a comprehensive way, going into details only when necessary.

The meeting will be held at 8 o'clock in Huntington Hall, Massachusetts Institute of Technology. All interested in the subject are invited to attend.

## CANDIDATES FOR MEMBERSHIP.

To be balloted on at meeting Feb. 17, 1909.

### AS MEMBERS.

FRED R. CHARNOCK, Medford, Mass. (b. 1862). Graduated from the Boston English High School in 1878 and took post graduate course in 1879. With City Engineer of Boston from 1879 to 1882; with Adams & Muzzey on sewer work at Keene, N. H.; on shallow flowage, Basin No. 2, Boston Water Works, fall of 1883 and early part of 1884; in City Architect's Office, Boston, from 1884 to 1890, having charge of foundation work for the Public Library and was superintendent on several other buildings; with Boston Steel & Iron Co. for fifteen years and at present is City Engineer of Medford. Recommended by F. I. Winslow, S. E. Tinkham, F. W. Hodgdon and H. B. Wood.

EDWARD AARON HASKELL, Newton, Mass. (b. 1864). Two years at Mass. Institute of Technology. Nearly two years with A. H. French, C. E.; and continuous service thereafter with B. & A. R. R., seven and one-half years in engineering department, thirteen years as roadmaster and one year as division engineer in charge of maintenance of tracks, bridges and buildings; now division engineer, B. & A. R. R., N. Y. C. & H. R. R. Co., lessee. Recommended by Walter Shepard, William Parker, W. G. S. Chamberlain and A. H. French.

FRANK ALWYN MARSTON, Boston (b. 1885). Graduated from the Worcester Polytechnic Institute in civil engineering course in June, 1907. From June to December, 1907, was employed by L. D. Thorpe, C. E., as assistant engineer on the design and construction of the Norwood, Mass. sewage disposal plant and pipe lines; December, 1907, entered the employ of Metcalf & Eddy, consulting engineers, with them he has been engaged on work for Louisville, Ky. sewerage system, and on water works for Concord, Mass., Livermore Falls, Me., and other places. Recommended by Leonard Metcalf, C. W. Sherman, R. S. Weston and W. T. Barnes.

RALPH I. McCORKINDALE, Somerville, Mass. (b. 1882). Educated at Rensselaer Polytechnic Institute, 1901 to 1905 inclusive. June 15 to Sept. 15, 1902, sub-inspector on concrete, U. S. Naval Coal Depot, Bradford, R. I.; July 1 to Oct. 1, 1905, concrete inspector, Holyoke Water Power Co.; Oct. 1, 1905, to June 25, 1906, inspector, Penn. Terminals, New York; June 25, 1906, to June 1, 1908, employed first as electrical estimator of the Thompson-Starrett Co., general contractors, New York City, and later as assistant mechanical engineer of the same company and in charge of electrical estimating and draughting; and since July 15, 1908, Steel Inspector for J. R. Worcester & Co., Boston. Recommended by J. R. Worcester, G. H. Brazer, E. E. Pettee and F. L. Murray.

## APPLICATIONS FOR MEMBERSHIP.

The following applications for membership have been received and are now before the Board of Government for approval. Members having information which will assist the government in its consideration of these applications are requested to communicate at once with any member of the Board. Communications will be regarded as confidential and for the use of the Board alone.

### AS MEMBERS.

CLAYTON ROLFE ELKINS, Boston (b. 1884). Educated at St. Johnsbury Academy 1900 to 1901. Boston English High School 1901-1903, and took courses in railroad engineering, surveying and mathematics at Y. M. C. A., Boston, 1904-1906. Employed by Rhodes & O'Brien, Denver, Colo., as rodman on the High Line Ditch Survey 1903; by the Edison Electric Ill. Co., Boston, as surveyor 1904-1906; in 1906 was employed by Boston & Albany R. R. as an inspector on concrete construction; had charge of the construction of an engine house and machine shop at Pittsfield; also the construction of a freight house, the laying out and construction of a railroad yard at Springfield and about 15 miles of third track construction. Recommended by William Parker, L. G. Morphy, R. E. Curtis and W. G. S. Chamberlain.

HERMAN W. FRENCH, Hyde Park, Mass. (b. 1883). Educated in public schools of Randolph and graduated from Stetson High School in 1901. Entered the employ of Whitman & Howard, February, 1902, as rodman, and later was transitman and head draughtsman; with Boston Elevated Railway Co. since May, 1906, as assistant engineer, Department of Elevated & Subway Construction. Recommended by G. A. Kimball, H. C. Hartwell, Channing Howard, J. R. Rablin and L. S. Cowles.

ARNOLD WINCHESTER HEATH, Chelsea, Mass. (b. 1885). Entered the Massachusetts Institute of Technology in 1904 and studied civil engineering there until June, 1908. During the summer of 1906 worked as rodman for the Pierce & Barnes Co., Boston, and entered the employ of the same company, October 1, 1908, and is still there, drafting and running transit. Recommended by H. F. Pierce, H. C. Hartwell, C. T. Fernald and L. S. Cowles.

DUGALD C. JACKSON, Brookline, Mass. (b. 1865). Graduated from civil engineering course, Pennsylvania State College, 1885. Spent two years as fellow and instructor in electrical engineering at Cornell University; was then employed by the Sprague electric railway and the Edison electric light interests for several years; after two years of electrical engineering contracting in Nebraska, held positions of assistant chief engineer of Sprague Electric Railway and Motor Co. and chief engineer of Central District of Edison General Electric Co., designed, built and operated many electric light and electric railway plants; was head of department of electrical engineering, University of Wisconsin for fifteen



and a half years and is now head of the department of electrical engineering; Massachusetts Institute of Technology and member of firm of D. C. & W. B. Jackson, consulting engineers. Recommended by G. F. Swain, W. E. McClintock, Desmond FitzGerald and C. F. Allen.

GRANVILLE JOHNSON, Boston (b. 1881). Harvard A. B. 1903, and S. B. 1904. Draughtsman with B. F. Sturtevant Co., Hyde Park, Mass., September, 1904, to February, 1905; assistant to the chief engineer of the Union Electric Light & Power Co., from February, 1905, to September, 1906; member of firm of Monks & Johnson, Engineers, 20 Central Square, Boston, from January, 1907, to present time. Recommended by J. R. Worcester, E. S. Larned, I. N. Hollis and H. S. Adams.

LEWIS EUGENE MOORE, Newton, Mass. (b. 1880). Graduated in mechanical engineering, University of Wisconsin, in 1900; one year in civil engineering, Massachusetts Institute of Technology, September, 1901, to June, 1902; given degree of civil engineer by University of Wisconsin in 1906; master mechanic, Champion Iron Mine, in 1900 and 1901; mechanical engineer, American Tin Plate Co. 1901; draftsman Phoenix Bridge Co. June, 1902, to September, 1903; rodman, bridge draftsman and masonry inspector, Illinois Central R. R., summers 1897-1901-1907; draftsman Bucyrus Steam Shovel Co., Milwaukee, Wis., summer 1904; draftsman Western Electric Co., summer 1906; summers and spare time since November, 1907, inspecting and computing bridges, Massachusetts Railroad Commissioners; instructor in structural detailing and mechanics, University of Wisconsin, September, 1903, to June, 1904; instructor and associate in theoretical and applied mechanics University of Illinois, September, 1904, to June, 1907; and from September, 1907, to date, assistant professor of civil engineering (bridge design and foundations) Massachusetts Institute of Technology. Recommended by G. F. Swain, S. E. Tinkham, C. B. Breed and C. F. Allen.

ERNEST CLIFFORD WILLARD, Louisville, Ky. (b. 1886). Worcester Polytechnic Institute, September, 1904, to June, 1905. Employed by Bailey-Classon, Fitchburg, Mass., as civil engineer, March, 1906 to September, 1906; with Smith & Brooks, civil engineers, Lowell, Mass., from September, 1906, to April, 1907; with Metropolitan Park Commission, Boston, from June, 1907 to September, 1908; and at present located with the Louisville Sewerage Commission, as civil engineer and draftsman. Recommended by H. P. Eddy, J. H. Kimball, D. A. Ambrose, and M. B. Smith.

## MINUTES OF MEETINGS.

### JANUARY MEETINGS OF THE SOCIETY.

BOSTON, JAN. 13, 1909.—A special meeting of the Boston Society of Civil Engineers was held at Chipman Hall, Tremont Temple, at 8 o'clock P. M., Vice President Francis W. Dean in the chair; one hundred and seventy-five members and visitors present.

Mr. Desmond FitzGerald gave a very interesting talk, illustrated by lantern slides, descriptive of the principal docks and harbors of Europe.

At the conclusion of Mr. FitzGerald's talk, a general discussion followed, after which the meeting adjourned.

S. E. TINKHAM, *Secretary*.

BOSTON, JAN. 27, 1909.—A regular meeting of the Boston Society of Civil Engineers was held at Chipman Hall, Tremont Temple, at 7.45 o'clock P. M., President Joseph R. Worcester in the chair. Seventy-nine members and visitors present.

The records of the last regular meeting and the special meeting of January 13, 1909, were read and approved.

Messrs. John F. Monaghan, Frank P. Morrill, David W. Stradling, James I. Tucker and Allen Van Rensselaer were elected members of the Society.

On motion of Mr. R. A. Hale, the President was requested to appoint a committee of three to report to the meeting the names of five members to serve as a committee to nominate officers for the ensuing year. The President appointed as that committee: Messrs. R. A. Hale, E. P. Adams and H. B. Wood. This committee reported later in the meeting the following names for members of the nominating committee: E. W. Howe, R. S. Weston, A. G. Robbins, E. S. Larned and N. S. Brock.

On motion of Mr. Olin, the report was accepted and the members named were chosen as the nominating committee.

Mr. Load, for the Committee on Excursions, moved that the thanks of the Society be extended to the local officials of the General Electric Company for courtesies shown members of the Society this afternoon on the occasion of the visit to works of that company at Lynn, Mass. The motion was unanimously adopted.

Mr. A. W. Parker moved the following resolution:—

WHEREAS, no full size tests on large compression members have been made, there being no testing machine of sufficient magnitude for the purpose, and

WHEREAS, the necessity for such tests has been fully established and the results obtained from them would add greatly to engineering knowledge and be of material benefit to the industries of this country, and

WHEREAS, it is the sense of this meeting of the Boston Society of Civil Engineers, that the building of a machine capable

of testing to destruction full size compression members of large dimensions, and of accurately recording results, is beyond the means of private interests, and can best be undertaken by the United States Government.

RESOLVED, that the United States Government be hereby requested to make a sufficient appropriation for and proceed with the construction of a testing machine which will accomplish the desired results.

RESOLVED, that the Secretary be directed to forward copies of this resolution to the President of the United States, the Vice-President and the Speaker of the House of Representatives.

On a vote being taken, the resolutions were adopted unanimously.

In the absence of the author, the Secretary read the first paper of the evening, entitled "A Specification for Filing and Indexing Railroad Plans," by H. K. Higgins.

Mr. Alfred D. Flinn gave an abstract of the paper prepared by him, entitled "The Filing and Indexing System of the Board of Water Supply of New York City," and followed it with a very interesting account of the work of the Board, which was fully illustrated by lantern slides.

Mr. Herbert C. Hartwell read the third paper, entitled "The System of Indexing Plans used by the Boston Elevated Railway Co., in the Department of Elevated and Subway Construction."

After a short discussion of the papers, the Society adjourned.

S. E. TINKHAM, *Secretary*.

## FEBRUARY MEETING OF THE SANITARY SECTION.

A meeting of the Sanitary Section was held at the Boston City Club on Wednesday, February 3, at 7.30 o'clock. Sixty-two members and guests were present. Mr. Harrison P. Eddy, Chairman of the Committee on Collection and Tabulation of Sewerage Statistics, presented a progress report. On motion the report was ordered printed in the Journal of the Association of Engineering Societies, together with the tabulation of sewerage statistics prepared by the Committee.

Mr. Harrison P. Eddy then addressed the section upon the subject of "Day Labor *vs.* the Contract System for doing Municipal Work." The talk was illustrated by diagrams and tables. The subject was discussed by several members.

ROBERT SPURR WESTON, *Clerk*.

## LIST OF MEMBERS.

## ADDITIONS.

JOHN F. MONAGHAN	.	.	.	1029 W. Colfax Ave., South Bend, Ind.
FRANK P. MORRILL	.	.	.	52 Greenleaf St., Malden, Mass.

## CHANGES OF ADDRESS.

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## DEATH.

TIMOTHY GUINEY	.	.	.	.	.	.	Died Feb. 4, 1909
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## LIBRARY NOTES.

## RECENT ADDITIONS TO THE LIBRARY.

**U. S. Government Reports.**

Interstate Commerce Commission, Annual Report for 1908.

Chief of Weather Bureau, Annual Report for 1906-07.

Commissioner of Education, Annual Report for 1907.

**State Reports.**

State Boundary Lines, Asbury, Blackstone, etc.,

Massachusetts Harbor and Land Commissioners Annual Report for 1908.

New York, Annual Report of State Engineer and Surveyor for 1907.

New Hampshire, Annual Report of R. R. Commissioners for 1908.

Connecticut, Annual Report of R. R. Commissioners for 1908.

**City and Town Reports.**

New Britain, Conn., Annual Town Reports, 1893 to 1900.

Bay City, Mich., Annual Reports of Water Commissioners, 1875 to 1904.

Rochester, N. Y., Annual Report Department of Public Works for 1907.

Atlantic City, N. J., Annual Report of Water Commissioners for 1907 and 1908.

Fall River, Mass., Annual Report of Water Board, 1908.

**Miscellaneous.**

Railroad Curves and Earthwork, with Tables, 4th edition.

C. Frank Allen. (Gift of the author.)



Laboratory Notes. Mrs. Ellen H. Richards.

Fire Protection of Mills. C. J. H. Woodbury.

Zeitschrift für Bauwesen, 1907-08.

New England Conference of Governors, 1908.

Reports of Insurance Engineering Experiment Station:—

On Fire-proof Wood;

On Composition Roofing;

On Bog Fuel;

On the Protection of Theatres;

On Baltimore Conflagration.

Report on Car Fender and Wheelguard Tests, N. Y. Public Service Commission.

FREDERIC I. WINSLOW, *Librarian*.

### BINDING THE JOURNALS.

Members who wish the Secretary to attend to the binding of their numbers of the *Journal* are requested to send them to Room 715, Tremont Temple, Boston, before MARCH 20.

Arrangements have been made by which members can have the *two* volumes bound in *one* for 70 cents, or each volume bound separately for 40 cents each; the style of binding to be the same and uniform with that of former years. Mark clearly which way it is desired the binding shall be done.

## NEW ENGINEERING WORK.

(Under this head the Excursion Committee proposes to present each month a brief résumé of engineering work in progress in New England, as far as such information is readily obtainable. The assistance of members is desired, and items of interest will be gladly received. Such items are intended to include not only works of exceptional magnitude or containing novel features, but also engineering construction work of all kinds and all degrees of magnitude. Notes should be in the hands of the Committee not later than the 2nd Wednesday of each month. The thanks of the Committee are due to the members who have furnished data for the Bulletin.—R. W. LOUD, Secretary, Excursion Committee, 1 Ashburton Place, Boston.)

**Commonwealth of Massachusetts.**—**CHARLES RIVER BASIN COMMISSION.**—*Work in Progress at the Dam and Lock.*—Driving piles for the harbor wall between the piers of the Boston Elevated Railway Co.

*Boston Marginal Conduit.*—Erecting five 6 ft. 4 in. x 7 ft. 8 in. sluice-gates at the gate-house at the outlet of the Stony Brook channels.

**HARBOR AND LAND COMMISSION.**—At the present time the contract is in progress for dredging the South River at Salem to make a depth of 8 feet at mean low water.

The work of dredging an extension of the anchorage basin, near Savin Hill, in Dorchester Bay, is still in progress.

The dredging of the boat harbor in Deacons Pond, in the town of Falmouth, has been completed, and the riprapping of the banks is still in progress.

At East Bay, Osterville, the dredging of the channel has been discontinued for the month of February owing to the cold weather, which also interferes with the transportation of the stone for the riprap work, though the delivery of the stone is still in progress.

At Sesuit Harbor, East Dennis, the work of constructing the stone jetty is still in progress.

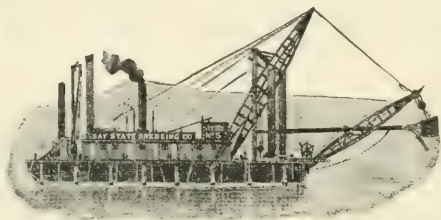
At Harwichport the riprapping of the banks at the entrance to Witchmere Harbor has just been commenced.

**Boston Transit Commission.**—It is expected that the Washington-Street Tunnel work in progress about Feb. 15, 1909, will consist mainly of making the changes in the old Subway at Haymarket Square.



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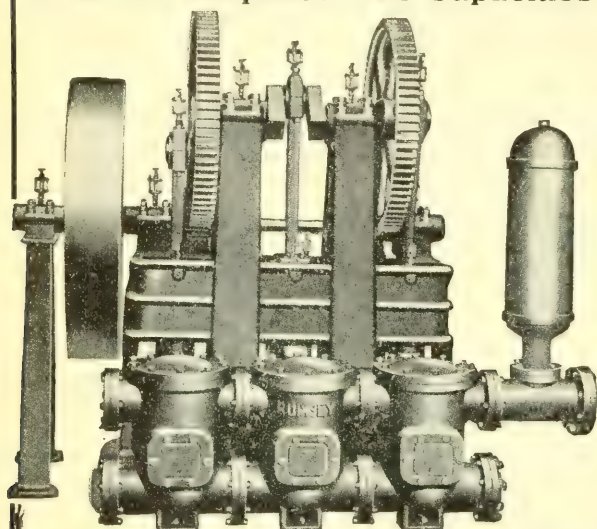
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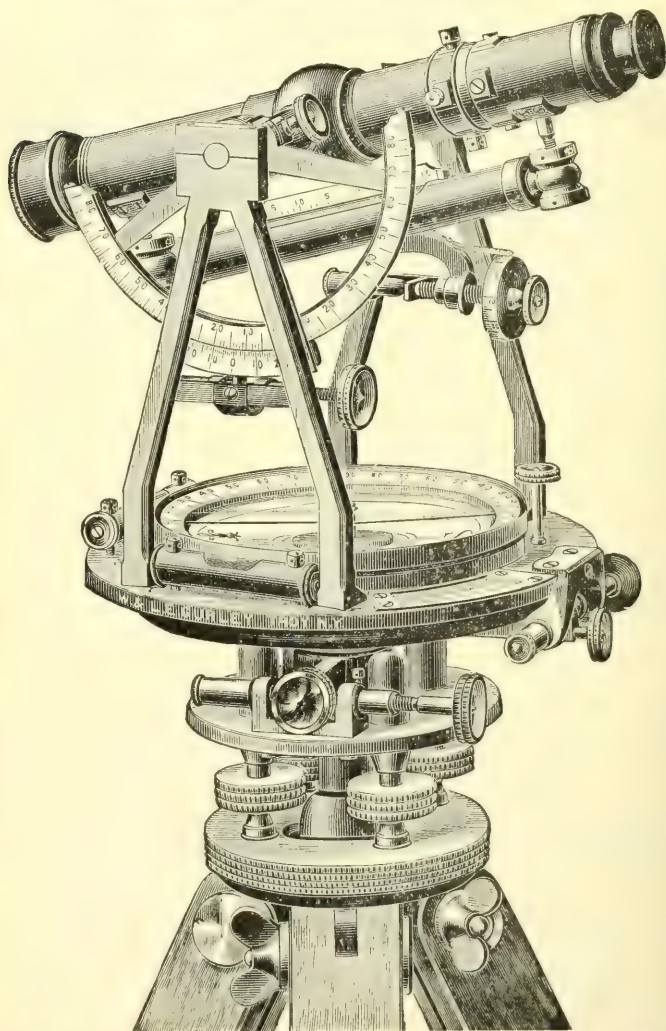
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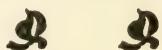
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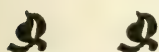
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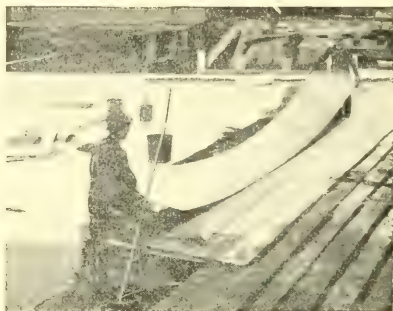
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# BOSTON SOCIETY OF CIVIL ENGINEERS.

ORGANIZED JULY 3, 1848.

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## MONTHLY BULLETIN.

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NEW SERIES.

MARCH, 1909.

No. 30

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### Annual Meeting, March 17, 1909

The annual meeting of the Boston Society of Civil Engineers will be held at the Boston City Club, 9 Beacon Street, Boston, on Wednesday, March 17, 1909.

As previously announced the annual meeting this year will occupy the whole of the day and will consist of three principal features: a business meeting in the forenoon, the annual dinner in the afternoon and a smoker in the evening.

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### PROGRAM

**Business Meeting.**—The annual meeting required by the Constitution will be called to order at 11 o'clock A. M., in Rooms 4 and 5, on the the third floor of the Club House.

**BUSINESS.**—To ballot on applications for membership. (See list of candidates in this Bulletin.)

To receive the annual reports of the Board of Government, of the Treasurer and of the Secretary.

To receive the annual reports of the several special committees.

To reappoint the several special committees.

To consider the report of the Committee on Larger Membership and Club House, submitted at the February meeting. (The report is printed in this Bulletin.)

To act on the amendments to the Constitution and By-Laws, presented at the February meeting. (See notice in this Bulletin.)

Announcement of the result of letter-ballot for officers for the ensuing year.

Address of the retiring President.

**Annual Dinner.**—The 27th annual dinner will be served at 2 o'clock, p. m., in the Auditorium on the fourth floor of the Club House.

The price of tickets for the dinner will be \$2.00 per plate. Members are at liberty to invite guests to the dinner as usual.

At the conclusion of the dinner, Mr. George B. Francis will give a non-technical talk on Railroad Terminals which will be very fully illustrated by lantern slides.

**Smoker.**—An informal smoker will be held in the Auditorium, beginning at 7 o'clock p. m.

One of the objects of the organization of the Society as defined in its constitution is "the encouragement of social intercourse among engineers and men of practical science." The criticism has sometimes been made that this object has been largely ignored in the work of the Society. This gathering has therefore been planned to afford the members and their friends an opportunity to meet socially, to renew old acquaintances and to form new ones, to extend fraternal greetings to those who have recently joined us and above all to foster a spirit of good fellowship among us. No formal exercises have been planned nor special entertainment provided, but through the courtesy of members residing in Greater Boston, light refreshments and music will be provided.

The Committee expect that each one present will feel that the success of the evening depends on his enthusiastic co-operation.

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## REGISTRATION, TICKETS AND BADGES

Members and guests who attend any of the functions of the annual meeting will find it more convenient to go directly to the third floor of the Club House, where special coat rooms will be provided for the exclusive use of the Society.

The rooms on the third and fourth floors which have been assigned to the Society for the annual meeting are entirely apart from the rest of the Club House used by its members.

Rooms 4 and 5 will be used as the Society headquarters continuously throughout the day and evening.

Each member is requested to register on cards provided for the purpose immediately on his arrival and to secure a badge which will be a means of identification throughout the meeting. They are also requested to register any guest whom they may introduce and to procure for him a special guest badge.

Members are urged to purchase at the time of registration the tickets they desire for the dinner and for guests at the Smoker.

The prices for tickets have been fixed as follows:

Dinner tickets for members and guests.....\$2.00 each

Smoker tickets for guests ..... 1.00 each

(There will be no charge for Smoker tickets for members of the Society, but tickets must be procured, as admission will be strictly by ticket.)

As the plan for the annual meeting this year is a radical change from that of former years, it is indispensable that the Committee be informed at as early date as possible how many will attend the several gatherings so that ample and satisfactory arrangements may be made. If a member finds that he can attend only the business meeting, it will help the Committee materially to know it in advance so that his badge may be prepared for him. The Committee therefore urges you most earnestly to fill out and mail the accompanying postal card as promptly as possible stating your intentions.

Tickets for the Dinner or Smoker may be obtained by addressing the Secretary at any time after the receipt of this circular.

JOSEPH R. WORCESTER,  
FREDERIC H. FAY,  
S. EVERETT TINKHAM,

*Committee.*



## AMENDMENTS TO THE CONSTITUTION AND BY-LAWS

The following amendments to the Constitution and By-Laws were offered at the last meeting and will come up for action at this meeting.

Amend Article II. of the Constitution by the addition of the following paragraph, to follow the third paragraph as it now stands : —

Members in good standing who have retained their membership for thirty years may, by relinquishing their right to receive notices and publications of the Society, be relieved from further payment of fees, dues and assessments, and still be retained on the roll of the Society as retired members.

Amend Section 7 of the By-Laws by adding thereto the following paragraph : —

Transfer of members to the retired list shall be made only by vote of the Board of Government.

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## CANDIDATES FOR MEMBERSHIP.

To be balloted on at meeting Mar. 17, 1909.

### AS MEMBERS.

CLAYTON ROLFE ELKINS, Boston (b. 1884). Educated at St. Johnsbury Academy 1900 to 1901, Boston English High School 1901-1903, and took courses in railroad engineering, surveying and mathematics at Y. M. C. A., Boston, 1904-1906. Employed by Rhodes & O'Brien, Denver, Colo., as rodman on the High Line Ditch Survey 1903; by the Edison Electric Ill. Co., Boston, as surveyor 1904-1906; in 1906 was employed by Boston & Albany R. R. as an inspector on concrete construction; had charge of the construction of an engine house and machine shop at Pittsfield; also the construction of a freight house, the laying out and construction of a railroad yard at Springfield and about 15 miles of third track construction. Recommended by William Parker, L. G. Morphy, R. E. Curtis and W. G. S. Chamberlain.

HERMAN W. FRENCH, Hyde Park, Mass. (b. 1883). Educated in public schools of Randolph and graduated from Stetson High School in 1901. Entered the employ of Whitman & Howard, February, 1902, as rodman, and later was transitman and head draughtsman; with Boston Elevated Railway Co. since May, 1906, as assistant engineer, Department of Elevated & Subway Construction. Recommended by G. A. Kimball, H. C. Hartwell, Channing Howard, J. R. Rablin and L. S. Cowles.

ARNOLD WINCHESTER HEATH, Chelsea, Mass. (b. 1885). Entered the Massachusetts Institute of Technology in 1904 and studied civil engineering there until June, 1908. During the summer of 1906 worked as rodman for the Pierce & Barnes Co., Boston, and entered the employ of the same company, October 1, 1908, and is still there, drafting and running transit. Recommended by H. F. Pierce, H. C. Hartwell, C. T. Fernald and L. S. Cowles.

DUGALD C. JACKSON, Brookline, Mass. (b. 1865). Graduated from civil engineering course, Pennsylvania State College, 1885. Spent two years as fellow and instructor in electrical engineering at Cornell University; was then employed by the Sprague electric railway and the Edison electric light interests for several years; after two years of electrical engineering contracting in Nebraska, held positions of assistant chief engineer of Sprague Electric Railway and Motor Co. and chief engineer of Central District of Edison General Electric Co., designed, built and operated many electric light and electric railway plants; was head of department of electrical engineering, University of Wisconsin for fifteen and a half years and is now head of the department of electrical engineering; Massachusetts Institute of Technology and member of firm of D. C. & W. B. Jackson, consulting engineers. Recommended by G. F. Swain, W. E. McClintock, Desmond Fitzgerald and C. F. Allen.

GRANVILLE JOHNSON, Boston (b. 1881). Harvard A. B. 1903, and S. B. 1904. Draughtsman with B. F. Sturtevant Co., Hyde Park, Mass., September, 1904, to February, 1905; assistant to the chief engineer of the Union Electric Light & Power Co., from February, 1905, to September, 1906; member of firm of Monks & Johnson, Engineers, 20 Central Square, Boston, from January, 1907, to present time. Recommended by J. R. Worcester, E. S. Larned, I. N. Hollis and H. S. Adams.

LEWIS EUGENE MOORE, Newton, Mass. (b. 1880). Graduated in mechanical engineering, University of Wisconsin, in 1900; one year in civil engineering, Massachusetts Institute of Technology, September, 1901, to June, 1902; given degree of civil engineer by University of Wisconsin in 1906; master mechanic, Champion Iron Mine, in 1900 and 1901; mechanical engineer, American Tin Plate Co. 1901; draftsman Phoenix Bridge Co. June, 1902, to September, 1903; rodman, bridge draftsman and masonry inspector, Illinois Central R. R., summers 1897-1901-1907; draftsman Bucyrus Steam Shovel Co., Milwaukee, Wis., summer 1904; draftsman Western Electric Co., summer 1906; summers and spare time since November, 1907, inspecting and computing bridges, Massachusetts Railroad Commissioners; instructor in structural detailing and mechanics, University of Wisconsin, September, 1903, to June, 1904; instructor and associate in theoretical and applied mechanics University of Illinois, September, 1904, to June, 1907; and from September, 1907, to date, assistant professor of civil engineering (bridge design and foundations) Massachusetts Institute of Technology. Recommended by G. F. Swain, S. E. Tinkham, C. B. Breed and C. F. Allen.

ERNEST CLIFFORD WILLARD, Louisville, Ky. (b. 1886). Worcester Polytechnic Institute, September, 1904, to June, 1905. Employed by Bailey-Classon, Fitchburg, Mass., as civil engineer, March, 1906 to September, 1906; with Smith & Brooks, civil engineers, Lowell, Mass., from September, 1906, to April, 1907; with Metropolitan Park Commission, Boston, from June, 1907 to September, 1908; and at present located with the Louisville Sewerage Commission, as civil engineer and draftsman. Recommended by H. P. Eddy, J. H. Kimball, D. A. Ambrose, and M. B. Smith.

## REPORT OF COMMITTEE ON LARGER MEMBERSHIP AND CLUBHOUSE.

BOSTON, February 17, 1909.

TO THE MEMBERS OF THE BOSTON SOCIETY OF CIVIL ENGINEERS :

At the regular meeting of the Society held on November 18, 1908, the following motion was passed :—

*Voted:* "That the Committee on Larger Membership and Clubhouse be continued, and instructed that it is the earnest desire of the Society to acquire a permanent home or Clubhouse at the earliest feasible time; that the Society desires the Committee to confer with the New England Water Works Association, the Architectural Societies, the Gas Engineers, the Railway and Railroad Clubs, and any other association which may be suggested or which, in their opinion, might be desirable to have co-operate with this Society in securing a suitable building; that the Committee carefully investigate the question of financing a building or clubhouse, and report at length as soon as possible."

In accordance with these instructions your Committee has given further consideration to the question of a suitable clubhouse or home for this Society. Four general propositions have been studied in some detail.

(1) A clubhouse without *cuisine*, to be used exclusively by the Boston Society of Civil Engineers.

(2) A commercial (ten-story) building with the several Engineering and Architectural Societies occupying the upper floors (a plan similar to the "Broad Street" scheme as worked up by a former committee).

(3) A union clubhouse without *cuisine*, for the exclusive use of the several Engineering and Architectural Societies whose headquarters are in Boston.

(4) A "technical clubhouse", combining all the features of a first-class club, with suitable smoking, dining, and perhaps sleeping rooms, the several Engineering and Architectural Societies to rent quarters in the building, but the membership of the club proper to be separate from the other societies.

In any of these schemes there are a few main questions that bear closely on the success of the enterprise. These concern the finances (including maintenance), location, sociability, accommodation for meetings, library (both as regards space and protection from fire), expansion, and possibility of using building for other purposes in case necessity arises.

SCHEME 1. A clubhouse for the exclusive use of the Boston Society of Civil Engineers no doubt appeals strongly to most of the members, and rightly so. The cost of a site, in such location as would prove acceptable to the majority of the members, would not be less than \$50,000. Add to this some \$25,000 for a three-story building with auditorium in the basement, fire-proof in order to properly protect our valuable library, and the burden imposed, especially that of maintenance, would surely be greater than the present finances seem to warrant. A *cuisine* in connection with this proposition would not be self-supporting.

SCHEME 2. The erection of a ten-story building to be used partly for offices, the balance to be given up to the various Engineering and Architectural Societies, would no doubt be feasible from a financial standpoint, but such an undertaking must necessarily be handled by an expert, and it is the opinion of your Committee that it would be preferable for the different societies to congregate in some existing building than for this Society to assume the responsibility of financing a new enterprise along these lines.

SCHEME 3. Your committee has received unofficial assurance that the Water Works Association and the Gas Engineers are willing to occupy new quarters with this Society on substantially the same basis as at present. Similar information shows that the Boston Society of Architects and the Boston Architectural Club would be willing to occupy quarters in a new building as joint tenants with the engineering societies. No conference has been held with officials of the Boston Section of the American Institute of Electrical Engineers, as the Board of Government has appointed a committee for this purpose. Any union building must be centrally located and contain an auditorium capable of seating at least 200 persons. The installation of a *cuisine* is not advocated.

Before any definite information can be obtained respecting the support which the societies above referred to will be willing to give to this scheme, some location must be found and some general plan of building proposed, with an estimate of the probable cost of construction and maintenance.

There is at the present time one piece of property on Beacon Hill for sale, centrally located and suitable for a union building site. The cost of site together with a new building would repre-



sent an outlay of least \$80,000. The minimum annual operating expenses for such a proposition are estimated as follows:—

\$80,000 @ 4 % . . . . .	\$3,200.00
Heat, light, water and insurance . . . . .	1,000.00
Janitor service and care . . . . .	1,000.00
Taxes (at \$16.25) . . . . .	1,300.00
Repairs and incidental . . . . .	500.00
Total . . . . .	<hr/> \$7,000.00

(Nothing is here allowed for sinking fund.)

The rent paid by the society and its sub-tenants for the present quarters is approximately \$2,000 per annum. With a slight re-adjustment of our dues, making the maximum dues \$10 instead of \$8 as at present, about \$1,000 might be added to the present income of the Society, (allowing for a reasonable number of resignations on account of such increase). The balance required, \$4,000, must be raised by rentals paid by the other societies.

SCHEME 4. A brief study of the local Engineering and Architectural professions indicates that there are probably 5,000 men employed in these professions within a radius of 15 miles of Boston. It occurred to your committee therefore, that with this large number from which to draw, a Technical Club might be formed, the membership being composed of engineers, architects, members of allied professions, and perhaps others associated in a business way with these professions; this Technical Club to purchase land and erect a suitable building for the accommodation of the Boston Society of Civil Engineers, and other Engineering or Architectural Associations. These associations would lease from the Technical Club that particular portion of the building which each is to occupy exclusively, and pay a fixed rental for such space. Suitable auditoriums would be provided for the use of the societies. The remainder of the building could be laid out as a first class club house with a kitchen and dining room, a common smoking room, small conference rooms, billiard and pool room, and possibly some sleeping rooms. The privileges of the club house portion of the building would be open to all members of the societies who are also members of the Technical Club, and to members of the Technical Club who may not be members of any individual society.



While numbers are necessary for the success of such an enterprise, the question of securing the sympathy and support of the influential men in the profession is of paramount importance.

The keynote of any change that is to be made in the present quarters, condition and general atmosphere of this Society ought to be the question of sociability. The immediate success of the City Club here in Boston is conclusive evidence of the fact that there is an increasing demand for a club with moderate dues, which is at all times inclusive rather than exclusive.

At the Annual Meeting it is hoped that the views of a majority of our members may be obtained on this important matter. In case any of the above propositions is cordially received, a further study of the subject may then be made and a detailed investigation instituted.

Respectfully submitted,

LUZERNE S. COWLES,  
CHARLES B. BREED,  
GEORGE A. CARPENTER,  
RALPH E. CURTIS,  
EDWARD S. LARNED,

*Committee.*

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#### APRIL MEETING.

At the regular meeting of the Society to be held on Wednesday evening, April 21, 1909, Mr. E. R. B. Allardice will read a paper entitled "Reforestation of the Marginal Lands of the Wachusett Reservoir of the Metropolitan Water Works."

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#### MEMBERSHIP CARDS.

The membership cards for 1909 are now ready for distribution and one will be mailed to any member on application to the Secretary.

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#### BINDING THE JOURNALS.

Members who wish the Secretary to attend to the binding of their numbers of the *Journal* are requested to send them to Room 715, Tremont Temple, Boston, before MARCH 20.

Arrangements have been made by which members can have the *two* volumes bound in *one* for 70 cents, or each volume bound separately for 40 cents each; the style of binding to be the same and uniform with that of former years. Mark clearly which way it is desired the binding shall be done.

### SOCIETY OF ARTS MEETINGS.

Through the courtesy of the Secretary of the Society of Arts announcement is made of the following meetings of that Society:—

March 15, 1909, Mr. H. W. Du Bois, mining engineer of Philadelphia, Pa., will speak on "The Detection of Salt in Mine Examinations."

March 25, 1909.—Prof. Robert S. Woodward, president of the Carnegie Institution, will speak on "The Larger Research Problems of the Carnegie Institution."

April 5, 1909. Prof. George E. Hale, director of the Mt. Wilson Solar Observatory of the Carnegie Institution, Pasadena, Cal., will address the society on the subject, "Solar Cyclones and Magnetic Fields," with lantern illustrations.

The meetings are held at 8 o'clock, in Huntington Hall, Massachusetts Institute of Technology. All interested in the subjects are invited to attend.

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### MEETING OF THE BOSTON SECTION, AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS.

A meeting of the Boston Section of the American Institute of Electrical Engineers will be held on Wednesday evening, March 17, 1909, at 8 o'clock, in the Auditorium of the Edison Electric Illuminating Company of Boston. This room is on the third floor of the new Edison Building, at 39 Boylston Street, Boston, between Tremont and Washington Streets.

Dr. Charles P. Steinmetz, consulting engineer for the General Electric Company at Schenectady, will present his paper "Prime Movers."

Representatives in the engineering departments of the General Electric Company, Westinghouse Electric & Mfg. Co. and the Allis-Chalmers Company have been invited to take part in the discussion.

A cordial invitation is extended to the members of the Boston Society of Civil Engineers to attend this meeting.

## LIST OF MEMBERS.

## ADDITIONS.

FRED R. CHARNOCK	. . .	City Hall Annex, Medford, Mass.	
ARTHUR F. HARKNES (Sanitary Section)		502 State House, Boston,	"
EDWARD A. HASKELL	. . .	5 Peabody St., Newton,	"
FRANK A. MARSTON	. . .	6 Haley St., Roxbury,	"
RALPH I. MCCORKINDALE	. . .	22 Spencer Ave., Somerville.	"
ALLEN VAN RENSELAER	. . .	Tufts College,	"
DAVID W. STRADLING	. . .	53 Chandler St., West Somerville,	"
JAMES I. TUCKER	. . .	76 Pearson Road, West Somerville,	"

## CHANGES OF ADDRESS.

FRANCIS E. ADAMS	. . .	Coffin Valve Co., Neponset, Mass.	
PAUL A. BABCOCK	. . .	5616 Prytania St., New Orleans, La.	
H. P. DRAKE	. . .	Box 61, Aspinwall, Pa.	
WM. B. FULLER	. . .	17 Battery Place, New York.	
HOWARD G. HARRISON	. . .	226 Liberty St., West, Savannah, Ga.	
J. W. MORRISON	. . .	60 Congress St., Room 201, Boston	
C. BARTON PRATT	. . .	30 Tremont St., Boston	
L. FRED. RICE	. . .	1147 Old South Bldg., Boston	
GEO. G. SHEDD	. . .	Ox Bow Camp, Copperfield, Baker Co., Ore.	
WALTER E. SPEAR	. . .	25 Municipal Bldg., New York City.	

## APPLICATIONS FOR MEMBERSHIP.

The following applications for membership have been received and are now before the Board of Government for approval. Members having information which will assist the government in its consideration of these applications are requested to communicate at once with any member of the Board. Communications will be regarded as confidential and for the use of the Board alone.

## AS MEMBERS.

CHARLES EVERETT ALLEN, Boston, (b. 1886). Graduate of Mass. Institute of Technology, 1907. Summer of 1904, inspector of materials and construction of pipe laying for Worcester Co. Gas Co.; summer of 1905, draftsman for same company; summer of 1907, draftsman American Bridge Co., New York City; summer of 1908, field assistant U. S. Geological Survey, hydrographic branch; assistant civil engineering, Mass. Institute of Technology, for school years 1907-08 and 1908-09. Recommended by C. F. Allen, J. A. Gould, H. K. Barrows and C. B. Breed.

HOWARD BOURNE LUTHER, Attleboro, Mass., (b. 1886). Graduated from Mass. Institute of Technology, 1908, some summer work during the

course, first as rodman and then as transitman with H. F. Conant, Attleboro; at present assistant in civil engineering at Mass. Institute of Technology. Recommended by G. F. Swain, C. F. Allen, A. G. Robbins and C. B. Breed.

HERBERT CARLETON POORE, Wollaston, Mass., (b. 1885.) Graduate of Fitchburg High School in 1903, and from Worcester Polytechnic Institute in civil engineering course in 1907, degree of B. S. Resident engineer under Mass. Highway Commissions from June 1907 to present time. Recommended by A. M. Lovis, C. S. Tinkham, L. L. Gerry and R. A. Vesper.

EDWIN HENRY ROGERS, Newton, Mass., (b. 1871). Fitted for Mass. Institute of Technology, at A. Hale's private school. From 1888 to 1892, rodman and transitman, City Surveyor's office, Boston; 1892 to 1895, transitman, chief of party and office assistant, Boston Board of Survey; 1895 to 1898, chief of party, and 1898 to 1902, assistant engineer, Street Laying-out Department, Boston; 1902 to Nov. 1, 1908, chief engineer Boston & Worcester Street Railway and other street railways for James F. Shaw & Co., street railway builders; and since Nov 1, 1908, city engineer of Newton, Mass. Recommended by W. P. Morse, I. W. Hastings, W. G. S. Chamberlain and J. W. Morrison.

WILLIARD COLBURN TANNATT, Jr., (b. 1879). Graduated from Mass. Agricultural College, engineering course, in 1906, and one year graduate work at Yale University, holding fellowship in geology, 1907. Two years (1901-1902) with W. H. Whitney on city surveys; four summers (1903-1907) with McClintock & Woodfall, as assistant on sewer construction; one college year (1906) as assistant on U. S. Geological Survey work with Prof. Emerson of Amherst; and since 1907 has been with McClintock & Woodfall, sanitary engineers, Boston. Recommended by J. L. Woodfall, C. S. Tinkham, H. A. Symonds and W. E. McClintock.

ALDEN SHEPARD TILESTON, Boston, (b. 1882). Educated in Mechanic Arts High School. Worked for W. H. Whitney, 1901-1903; for C. H. Gannett, 1903-04; with City Engineer of Dover, N. H., 1905-1906-1907; with W. F. Whitman, Dedham, 1907-1908; and at present with C. H. Gannett, Boston, on general engineering. Recommended by C. H. Gannett, E. W. Hadcock, E. P. Adams and H. A. Hanscom.

#### AS AN ASSOCIATE.

ARTHUR ISAAC NEGUS, Melrose, Mass., (b. 1865). Superintendent construction department, Warren S. S. Co., 1892-1899, under Capt. H. O. Johnson; foreman carpenter East Boston tunnel, 1900-1901; night superintendent East Boston Tunnel, 1902-1903; superintendent Aberthaw Construction Co., 1904, on Harvard Stadium and other work; and now superintendent of construction department Malden and Melrose Gas Light Co., and allied companies of same corporation. Recommended by I. N. Hollis, L. J. Johnson, C. R. Gow and E. S. Larned.

## MINUTES OF MEETINGS.

### FEBRUARY MEETINGS OF THE SOCIETY.

Boston, Feb. 17, 1909. — A regular meeting of the Boston Society of Civil Engineers was held at Chipman Hall, Tremont Temple, at 7.45 o'clock P. M., President Joseph R. Worcester in the chair; fifty-two members and visitors present.

The record of the last regular meeting was read and approved.

Messrs. Fred R. Charnock, Edward A. Haskell, Frank A. Marston and Ralph I. McCorkindale were elected members of the Society.

Mr. Cowles, for the Committee on Larger Membership and Club House, submitted and read a report from that committee. On motion of Mr. French it was voted to accept the report and to print it in the next issue of the Bulletin. It was also voted to continue the committee.

On motion of Mr. Howe, the President was requested to appoint a committee of such a number as he deemed best, to co-operate with the committee of local members of the American Society of Civil Engineers on arrangement for the annual convention of that society to be held at Bretton Woods, N. H. in July next.

The Secretary announced the death of Timothy Guiney, a member of the Society, which occurred Feb. 4, 1909, and by vote the President was requested to appoint a committee to prepare a memoir. The President has appointed as members of the committee, John N. Ferguson and John L. Howard.

The Secretary read the following amendments to the Constitution and By-laws which had been submitted in writing:—

Amend Article 11 of the constitution by the addition of the following paragraph, to follow the third paragraph as it now stands:—

Members in good standing who have retained their membership for thirty years, may, by relinquishing their right to receive notices and publications of the Society, be relieved of further payment of fees, dues and assessments, and still be retained on the roll of the Society, as retired members.



Amend Section 7 of the By-laws by adding thereto the following paragraph:—

Transfer of members to the Retired list shall be made only by vote of the Board of Government.

The President called Mr. A. H. French to the chair who introduced Mr. Henry M. Haven, member of the American Society of Mechanical Engineers, who read a very carefully prepared paper entitled "Mechanical Refrigeration and some of its Modern Applications." The paper was fully illustrated by lantern slides.

After a short discussion, on motion of Mr. Howe, the thanks of the Society were tendered Mr. Haven for his very interesting paper.

Adjourned.

S. E. TINKHAM, *Secretary*.

### MARCH MEETING OF THE SANITARY SECTION.

The annual meeting of the Sanitary Section of the Boston Society of Civil Engineers, was held at the Boston City Club, on March 3, at 7.30 o'clock. Reports of the committees on "The Run-off from Sewered Areas," "The Manufacture of Sewer Pipe," and "The Collection and Tabulation of Sewerage Statistics" respectively, were read and placed on file. The report of the Executive Committee was read, and showed a membership of 173, including 20 who are not members of the Boston Society of Civil Engineers.

The following officers were elected for the coming year:

Chairman	. . . . .	FRANK A. BARBOUR
Vice-Chairman	. . . . .	BERTRAM BREWER
Clerk	. . . . .	ROBERT SPURR WESTON
Additional Members of the	. . . . .	{ WILLIAM S. JOHNSON GEORGE A. CARPENTER ALEXIS H. FRENCH
Executive Committee	. . . . .	

Arthur Fuller Harkness was elected a member.

William S. Johnson presented a paper entitled, "The Volume of Sewage in Sewers Designed According to the Separate System." Several members took part in the discussion. Fifty-one members and guests were present.

ROBERT SPURR WESTON, *Clerk*.

## LIBRARY NOTES.

### RECENT ADDITIONS TO THE LIBRARY.

#### U. S. Government Reports.

Coast and Geodetic Survey, Annual Report for 1908.

#### City and Town Reports.

Boston Transit Commission, Annual Report for 1907-08.

Gloucester, Mass., Annual Report of Water Commissioners, 1908.

Kennebec Water District, Annual Reports for 1906-1907-1908.

New Bedford, Mass, Annual Report of Water Board, 1908.  
(Contains a valuable report on electrolysis.)

#### Miscellaneous.

Reinforced Concrete Construction, pocket-book. E. L. Heidenreich.

Reinforced Concrete Arches. Arvid Reuterdaahl.

Practical Cement Testing. W. Purves Taylor.

Hydro-electric Practice. H. A. E. C. Von Schon.

FREDERIC I. WINSLOW, *Librarian.*

## NEW ENGINEERING WORK.

(Under this head the Excursion Committee proposes to present each month a brief résumé of engineering work in progress in New England, as far as such information is readily obtainable. The assistance of members is desired, and items of interest will be gladly received. Such items are intended to include not only works of exceptional magnitude or containing novel features, but also engineering construction work of all kinds and all degrees of magnitude. Notes should be in the hands of the Committee not later than the 2nd Wednesday of each month. The thanks of the Committee are due to the members who have furnished data for the Bulletin.—R. W. LOUD, Secretary, Excursion Committee, 1 Ashburton Place, Boston.)

**Commonwealth of Massachusetts.**—CHARLES RIVER BASIN COMMISSION.—*Work in Progress at the Dam and Lock.*—Driving piles and placing gravel fill for harbor wall, and transferring wires for electrical control of lock-gates and drawbridge from temporary operating house to final location in tower.

*Boston Marginal Conduit.*—The five sluice-gates at the outlet of the Stony Brook channels have been installed, although the motors are not yet in place.

**HARBOR AND LAND COMMISSIONERS.**—At the present time the contract is in progress for dredging the South River at Salem to make a depth of 8 feet at mean low water.

The work of dredging an extension of the anchorage basin, near Savin Hill, in Dorchester Bay, is still in progress.

Riprapping the banks of Deacons Pond in the town of Falmouth, is still in progress.

At East Bay, Osterville, the work of dredging the channel is suspended during the cold weather, and the riprap work is nearly completed.

At Sesuit Harbor, East Dennis, the work of constructing the stone jetty is still in progress.

At Harwichport the riprapping of the banks at the entrance to Witchmere Harbor is in progress.

**HIGHWAY COMMISSION.**—The only state highway work in progress at present is in the town of Becket.

**Boston Transit Commission.**—It is expected that the Washington-Street Tunnel work in progress about March 15, 1909, will consist mainly of making the changes in the old Subway at Haymarket Square.

**Boston Elevated Railway.**—**ELEVATED AND SUBWAY CONSTRUCTION.**—*Forest Hills Station.*—Erection of station steel-work is now in progress. The steel frame will later be encased in reinforced concrete, the platforms and track floor to be also of the same material.

*Station Alterations.*—Extensive alterations are being made in the steel structure at Dudley Street, South and City Square Stations. At the latter place shoring the main elevated structure for a considerable distance has been necessary as the track alignment and station platforms are to be radically changed.

*East Cambridge Extension.*—Charles River Bridge.—This bridge is to consist of 10 spans of masonry arches varying from 98 feet to 122 feet and a rolling lift draw bridge of the double leaf type, the whole being designed to carry two elevated tracks. At the present time 8 of the 12 pier foundations are complete and one partially completed. The contractor is laying stone facing above grade 112 (grade 100 being mean low water). On another foundation the cofferdam is being constructed preparatory to depositing concrete under water between grades 72 and 98. All of the foundations are concrete protected by 6 or 8 inches

of sheeting from the bottom to grade 98, and from the latter grade to grade 126.08 the concrete is faced with granite.

**New York, New Haven & Hartford R. R.**—WORCESTER, MASS.—The work in connection with the abolition of grade crossings at Southgate and Cambridge Streets on the Norwich line, which was undertaken the past year, has been practically completed including about 20,000 cubic yards concrete masonry.

The elevation of tracks through the city will be commenced the coming season.

**Boston.**—CHARLESTOWN—The test piers built by the Aberthaw Construction Co., under the direction of the Navy Department, are in place at the Charlestown Navy Yard. They are supported from one of the wharves so that the bottom of each pier is below low tide, the top above high tide. Some of the piers are mixed with wet concrete, others with dry concrete, with different proportions and with different cements. Careful record is kept of these. All piers have been weighed; all cement, aggregate, etc. analyzed by Mr. Herbert L. Sherman, Cement Chemist, and records are on file at the Navy Department and at the offices of Mr. Sherman and the Aberthaw Construction Co., either of whom would be glad to furnish information regarding any of the work that interests any of the engineers.

**Malden, Mass.**—The Aberthaw Construction Co., is building a factory beside the Western Division tracks at the Edgeworth Station, Malden, for the Converse Rubber Shoe Co. according to J. R. Worcester & Co.'s designs. The building is 145 x 60, three stories high, concrete floors, steel truss roof, brick walls; foundations furnished by another contractor. Work was started in these foundations January 11; the building is now closed in, floors in position, and finish going on. The job is interesting as showing methods of handling concrete during cold weather.

**Springfield, Mass.**—On Contract No. 1, Little River Water Supply, F. T. Ley & Co., Contractors, the work of lining the tunnel is being started. Active work on the concrete dam will be started as soon as the season permits.

Contract No. 5, work on Borden Brook Reservoir by Coleman Bros. The equipment is being placed so that work may be started early in the spring.

**City of Boston.**—SEWER DIVISION, STREET DEPARTMENT.—  
*Section 5, Commissioners' Channel, Stony Brook.*—Work now in progress between Keyes Street and Lotus Place, West Roxbury, lying between Jamaica Plain and Forest Hills. 20 feet by 16 feet reinforced steel concrete channel, with sanitary sewer carried along on one haunch. This job was more fully described in a former bulletin and the same description now applies.

*Section 4, Old Channel of Stony Brook.*—A double flat top steel concrete conduit, each channel 8 feet 3 inches horizontal by 10 feet 6 inches vertical. Working in Rogers Avenue, near Ruggles Street, Roxbury.

*Vernon Street, Roxbury,* opposite Downing Street, in private land, 8 feet by six feet, concrete arch, replacing a double stone culvert.

*Avenue Louis Pasteur, Roxbury,* from Longwood Avenue to the Fenway. Sewer and surface drain in same trench on pile foundation.

*Roslindale Brook, Roslindale,* between Ashland and Poplar Streets. Large concrete conduit, about 7 feet in diameter.

*Shepard Brook, Shepard Street, Brighton,* near Washington Street. Concrete conduit, about 3 feet in diameter.



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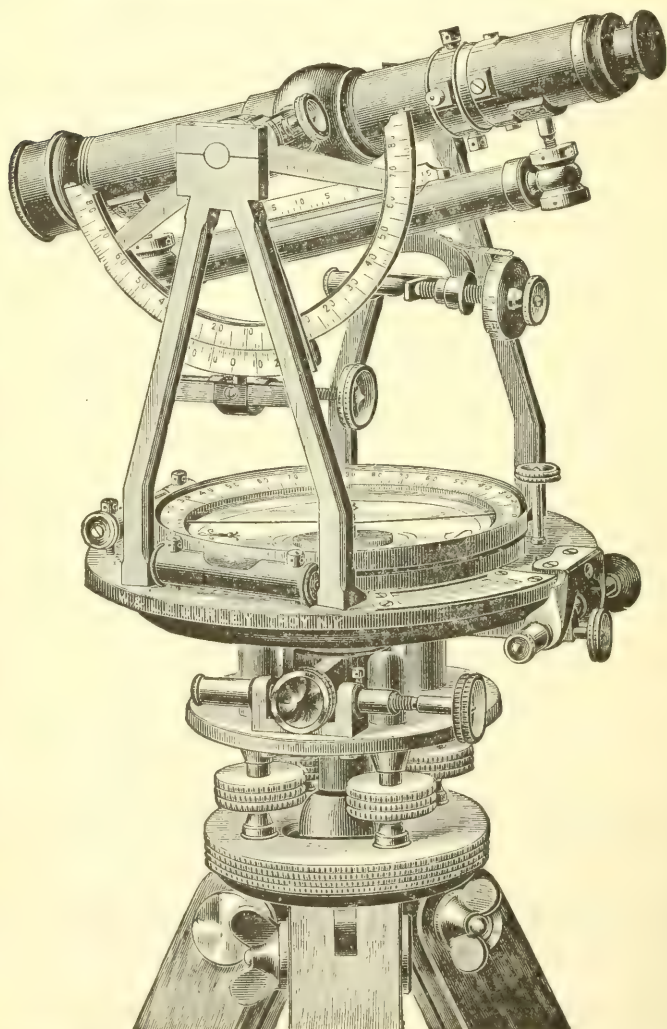
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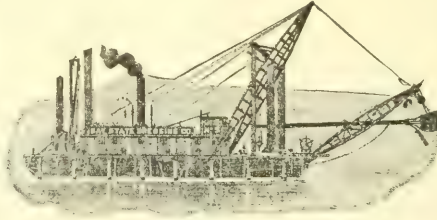
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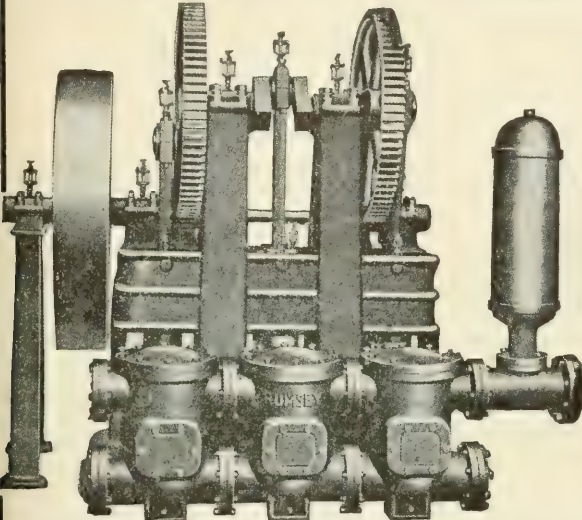
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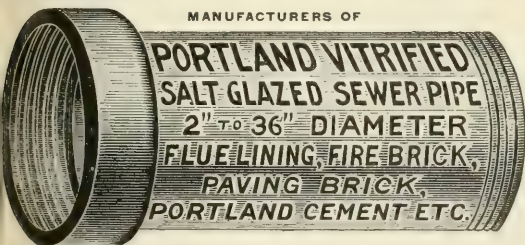
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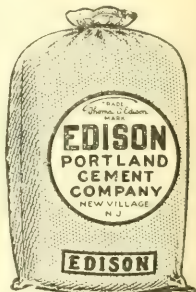
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# MONTHLY BULLETIN.

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NEW SERIES.

APRIL, 1909.

No. 31

---

## REGULAR MEETING.

A regular meeting of the Boston Society of Civil Engineers will be held on Wednesday, April 21, 1909, at 7.45 P. M., in

CHIPMAN HALL, TREMONT TEMPLE, BOSTON.

Mr. E. R. B. Allardice will read a paper entitled "Reforestation of the Marginal Lands of the Wachusett Reservoir of the Metropolitan Water Works." The paper will be illustrated by lantern slides.

It is expected that Mr. Frank William Rane, State Forester, Prof. Austin Cary, Professor of Forestry at Harvard University, and Mr. Arthur A. Shurtleff, Landscape Architect, will be present and take part in the discussion on Reforestation.

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**BUSINESS OF THE MEETING:** To ballot on the applications for membership as announced in this notice.

S. E. TINKHAM, *Secretary.*

---

Excursions, April 21, to Railroad terminals at Allston and to No. 10 Ashburton Place, see page 2 of this Bulletin.

Panama Canal Meeting on May 5, see notice on page 3 of this Bulletin.

## EXCURSION APRIL 21, 1909.

There will be an excursion on Wednesday afternoon, April 21, 1909, to the locomotive terminal of the Boston & Albany Railroad at Allston, Mass., which consists briefly of a modern interlocking plant, an 800-ton coal trestle with heavy incline and Barney car machinery, depressed ash pits, 85-ft. turntable, new 30-stall engine house, machine shop, fan and generator room, boiler house, stack and appurtenances; and also to the new freight terminal at East Cambridge, Mass., which consists of a freight house and bulk delivery yard.

The terminal facilities at both these locations have recently been completed and are now in use.

An engine with special car attached will leave the South Station at 2 P. M. for Allston where the party will stop for examination of the terminal. From Allston the car will convey the party to East Cambridge. After inspecting the terminal facilities at the latter location, the party will proceed by electric to the building on Ashburton Place, Boston, mentioned elsewhere in the Bulletin.

The expense of the trip will probably not exceed twenty-five (25) cents per member.

Members are requested to wear their excursion buttons.

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## EXCURSION TO NO. 10 ASHBURTON PLACE.

The joint committee, consisting of the Board of Government and the newly appointed committee on Permanent Quarters and Larger Membership, are considering the property located at No. 10 Ashburton Place as a home for this Society. The building will be open for inspection on April 21, 1909, from 4 to 6 P. M., to afford members an opportunity to examine the property. Members are requested to make an effort to visit this site in order that they may become acquainted with its merits and defects, and to be able to judge as to its fitness for permanent quarters of the Society.

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## MAY EXCURSION.

The excursion committee are planning an outing to Springfield, Mass., to inspect the new construction on the Little River project for the Springfield Water Works, about the middle

of May, when it is expected that the N. E. W. W. Association will join with the Boston Society of Civil Engineers. It is now planned to leave Boston by train about 7.30 P. M., arriving in Springfield at 10.30 P. M. The party will stop over night at one of Springfield's famous hotels from which an early start will be made the next morning.

The entire day will be spent in the examination of the works, returning to Boston by late train.

Further details will be announced later.

### MAY MEETING.

At the regular meeting of the Society to be held on Wednesday evening, May 19, 1909, Mr. E. P. Dawley will read a paper describing the Railroad Tunnel recently built at Providence, R. I., for the N. Y., N. H. & H. R. R. The paper will be illustrated by lantern slides.

### PANAMA CANAL MEETING.

A special meeting of the Society will be held in Chipman Hall, Boston, at 8 o'clock P. M., on Wednesday, May 5, 1909.

Messrs. Frederic P. Stearns, John R. Freeman and Allen Hazen, members of the Board of Engineers, appointed to accompany President-elect Taft on his recent visit of inspection to the Panama Canal, will describe what has been accomplished at the Isthmus and speak generally of the design and construction of the Canal. The lantern will be used to illustrate the descriptions.

It is hoped there will be a large attendance of members, thus showing our appreciation of the honor to the Society of the selection of three of its members for this very important duty.

### CANDIDATES FOR MEMBERSHIP.

To be balloted on at meeting April 21, 1909.

AS MEMBERS.

CHARLES EVERETT ALLEN, Boston, (b. 1886). Graduate of Mass. Institute of Technology, 1907. Summer of 1904, inspector of materials and construction of pipe laying for Worcester Co. Gas Co.; summer of 1905,

draftsman for same company; summer of 1907, draftsman American Bridge Co., New York City; summer of 1908, field assistant U. S. Geological Survey, hydrographic branch; assistant civil engineering, Mass. Institute of Technology, for school years 1907-08 and 1908-09. Recommended by C. F. Allen, J. A. Gould, H. K. Barrows and C. B. Breed.

HOWARD BOURNE LUTHER, Attleboro, Mass., (b. 1886). Graduate Mass. Institute of Technology, 1908, some summer work during the course, first as rodman and then as transitman with H. F. Conant, Attleboro; at present assistant in civil engineering at Mass. Institute of Technology. Recommended by G. F. Swain, C. F. Allen, A. G. Robbins and C. B. Breed.

HERBERT CARLETON POORE, Wollaston, Mass., (b. 1885.) Graduate of Fitchburg High School in 1903, and from Worcester Polytechnic Institute in civil engineering course in 1907, degree of B. S. Resident engineer under Mass. Highway Commissions from June 1907 to present time. Recommended by A. M. Lovis, C. S. Tinkham, L. L. Gerry and R. A. Vesper.

EDWIN HENRY ROGERS, Newton, Mass., (b. 1871). Fitted for Mass. Institute of Technology, at A. Hale's private school. From 1888 to 1892, rodman and transitman, City Surveyor's office, Boston; 1892 to 1895, transitman, chief of party and office assistant, Boston Board of Survey; 1895 to 1898, chief of party, and 1898 to 1902, assistant engineer, Street Laying-out Department, Boston; 1902 to Nov. 1, 1908, chief engineer Boston & Worcester Street Railway and other street railways for James F. Shaw & Co., street railway builders; and since Nov 1, 1908, city engineer of Newton, Mass. Recommended by W. P. Morse, I. W. Hastings, W. G. S. Chamberlain and J. W. Morrison.

WILLARD COLBURN TANNATT, Jr., (b. 1879). Graduated from Mass. Agricultural College, engineering course, in 1906, and one year graduate work at Yale University, holding fellowship in geology, 1907. Two years (1901-1902) with W. H. Whitney on city surveys; four summers (1903-1907) with McClintock & Woodfall, as assistant on sewer construction; one college year (1906) as assistant on U. S. Geological Survey work with Prof. Emerson of Amherst; and since 1907 has been with McClintock & Woodfall, sanitary engineers, Boston. Recommended by J. L. Woodfall, C. S. Tinkham, H. A. Symonds and W. E. McClintock.

ALDEN SHEPARD TILESTON, Boston, (b. 1882). Educated in Mechanic Arts High School. Worked for W. H. Whitney, 1901-1903; for C. H. Gannett, 1903-04; with City Engineer of Dover, N. H., 1905-1906-1907; with W. F. Whitman, Dedham, 1907-1908; and at present with C. H. Gannett, Boston, on general engineering. Recommended by C. H. Gannett, E. W. Haddock, E. P. Adams and H. A. Hanscom.

#### AS AN ASSOCIATE.

ARTHUR ISAAC NEGUS, Melrose, Mass., (b. 1865). Superintendent construction department, Warren S. S. Co., 1892-1899, under Capt. H. O. Johnson; foreman carpenter East Boston tunnel, 1900-1901;



night superintendent East Boston Tunnel, 1902-1903; superintendent ent Aberthaw Construction Co., 1904, on Harvard Stadium and other work; and now superintendent of construction department Malden and Melrose Gas Light Co., and allied companies of same corporation. Recommended by I. N. Hollis, L. J. Johnson, C. R. Gow and E. S. Larned.

## MEETING OF THE BOSTON SECTION, AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS.

A meeting of the Boston Section of the American Institute of Electrical Engineers will be held on Wednesday evening, April 21, 1909, at 8 o'clock, in the Auditorium of the Edison Electric Illuminating Company, 39 Boylston Street, Boston, between Tremont and Washington Streets.

Captain Clifton C. Carter will present a paper entitled "Some Electrical and Mechanical Engineering Practices and Problems Relating to Coast Defense." This paper will be illustrated by lantern slides.

A cordial invitation is extended to the members of the Boston Society of Civil Engineers to attend this meeting.

### LIST OF MEMBERS.

#### ADDITIONS.

CLAYTON R. ELKINS	20 York St., Dorchester
HERMAN W. FRENCH	101 Milk St., Room 1001, Boston
HENRY W. HAYES	8 Beacon St., Boston
ARNOLD W. HEATH	147 Milk St., Boston
DUGALD C. JACKSON	Mass. Inst. of Tech., Boston
GRANVILLE JOHNSON	Monks & Johnson, 20 Central St., Boston
ELMER G. MANAHAN	43 Eppirt St., East Orange, N. J.
LEWIS E. MOORE	85 Washington Park, Newtonville, Mass.
ERNEST C. WILLARD	605 Equitable Building, Louisville, Ky.

#### CHANGES OF ADDRESS.

C. P. ABBOTT	Box 259, Valhalla, N. Y.
E. M. BLAKE	Richfield, Lincoln Co., Idaho
W. S. BROCK	Brown Station, N. Y.
G. A. CLARK	72 Marginal St., East Boston
W. M. FOSTER	Box 495, Brattleboro, Vt.
L. W. MILLAR	2400 Harrison St., Evanston, Ill.
R. R. NEWMAN	175 Mt. Auburn St., Cambridge
JOHN J. PHELAN	15 Custom House, Baltimore, Md.
J. A. STARR	Box 511, Wilmington, Del.
H. A. SYMONDS	15 State St., Westfield, Mass.
J. S. C. TABER	23 Norman Road, Newton Highlands, Mass.
E. D. TREADWELL	124 Linden Ave., Malden, Mass.

## RESIGNATIONS.

PERCY C. BARNEY . . . . .	March 17, 1909
CHARLES D. BRAY . . . . .	March 17, 1909
BENJAMIN G. BUTTOLPH . . . . .	March 17, 1909
FRED R. DAVIS . . . . .	March 17, 1909
FRANK B. FRENCH . . . . .	March 17, 1909
LEVI R. GREENE . . . . .	March 17, 1909
WILLIAM F. KEENE . . . . .	March 17, 1909
FRANK P. MCKIBBEN . . . . .	March 17, 1909
WALTER W. PATCH . . . . .	March 17, 1909
CHARLES H. PECK . . . . .	March 17, 1909
BERTRAM W. RANSOM . . . . .	March 17, 1909
CHARLES W. CONANT, (Sanitary Section) . . . . .	March 17, 1909

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## Lewis Frederick Rice.

Member of the Boston Society of Civil Engineers.

Vice-President, March 19, 1884 to March 16, 1887.

President, March 16, 1887, to March 21, 1888

Born May 17, 1839.

Joined the Society June 8, 1874.

Died April 12, 1909.

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### MEMBERSHIP CARDS.

The membership cards for 1909 are now ready for distribution and one will be mailed to any member on application to the Secretary.

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### BINDING THE JOURNALS.

Members who wish the Secretary to attend to the binding of their numbers of the *Journal* must send them to Room 715, Tremont Temple, Boston, at once.

## LIBRARY NOTES.

### RECENT ADDITIONS TO THE LIBRARY.

#### State Reports.

Ohio, Annual Report, State Board of Health, 1908.

#### City and Town Reports.

Attleboro, Mass., Annual Report of Water Dept., 1908.

Brookline, Mass., Annual Report of Water Board, 1908.

Detroit, Mich., Annual Report of Water Commissioners, 1908.

Fitchburg, Mass., Annual Report of City Engineers, 1908.

Haverhill, Mass., Annual Report of Water Commissioners, 1908.

Leominster, Mass., Annual Report of Water Board, 1908.

Marlboro, Mass., Annual Report of Water Commissioners, 1908.

Providence, R. I., Quarterly Report Dept. Public Works.

Rutland, Vt., Annual City Report, 1908.

St. Paul, Minn., Annual Report of Water Commissioners, 1908.

#### Miscellaneous.

The Steam Turbine, Jas. A. Moyer. Gift of Author.

Hand-book of Fire-protection, Crosby Fiske.

Hinter Pflug un Schraubstock. Max Eyth.

Der Schneider von Ulm, 2 vols. Max Eyth.

FREDERIC I. WINSLOW, *Librarian.*

### APPLICATIONS FOR MEMBERSHIP.

The following applications for membership have been received and are now before the Board of Government for approval. Members having information which will assist the government in its consideration of these applications are requested to communicate at once with any member of the Board. Communications will be regarded as confidential and for the use of the Board alone.

#### AS MEMBERS.

HENRY BISSELL ALVORD, South Weymouth, Mass. (b. 1885). Graduate of Mass. Institute of Technology in civil engineering, 1907. Has been employed as rodman, transitman and engineer's assistant in the last three successive seasons, with the Mass. Harbor and Land Commission, in work of town-boundary surveys under H. B. Wood. For the last two years has been employed at Institute of Technology as assistant in civil engineering. Recommended by C. F. Allen, H. B. Wood, W. C. Hawley and C. B. Breed.

MOSES BURPEE, Houlton, Me. (b. 1847). Began civil engineering experience in 1868 as rodman, Fredrickton Railway, N. B.; later experience as draftsman, instrument man, etc., to 1870; then assistant locating and construction engineer, N. B. Railway, until 1887; 1879 to 1883, assistant engineer, C. M. & St. P. Railway and C. P. Railway; maintenance of way engineer, N. B. Railway and C. P. Railway, 1885 to 1891; and 1892 to date, chief engineer Bangor & Aroostook Railroad. Recommended by G. B. Francis, E. J. Beugler, L. W. Tucker and J. H. O'Brien.

JOHN FRANCIS CALLAHAN, JR., Boston (b. 1884). Pursued courses in civil engineering at Harvard and Tufts for two and one-half years, beginning in the fall of 1904; entered the employ of the Boston Elevated Railway Co. in July, 1906, and was engaged in the construction of the Forest Hills Extension, topographical surveys, and preliminary work for East Cambridge Extension, until Oct. 31, 1906; on Nov. 1, 1906, entered the employ of the Charles River Basin Commission, and has been engaged up to the present time in the construction of the lock, dam and marginal conduit, and is still with that commission. Recommended by J. A. Holmes, J. L. Howard, J. N. Ferguson and H. M. McCue.

EDWIN PELEG DAWLEY, Providence, R. I. (b. 1853). 1872 to 1880, student, and afterwards assistant engineer on Providence Water and Sewerage Works; 1880 to 1882, engineer and superintendent, Interstate Telephone Co.; 1882 to 1892, engineer and chief engineer, New York, Providence & Boston Railroad Co.; 1892 to 1909, division engineer at Providence and Boston, assistant chief engineer at Boston, and engineer of construction at New Haven and Providence, for New York, New Haven & Hartford Railroad Co., and at present consulting engineer, with office in Providence. Recommended by G. B. Francis, J. W. Ellis, O. F. Clapp, W. D. Bullock and S. E. Tinkham.

RALPH WALDO EMERSON, Hingham, Mass. (b. 1876). Educated at Deering High School, Portland, Me. Manager, New England Telephone & Telegraph Co., at Hingham and Dedham, Sept., 1898, to April, 1904; rodman nine months with W. F. Whitman, Dedham, on surveys and sewer construction; rodman one year with Metropolitan Park Commission, largely on construction; rodman five months with Mass. Highway Commission, surveys and layouts; with Charles River Basin Commission, Sept., 1906, to date, first as rodman, afterwards promoted to instrument man, and now in charge of office works in connection with the construction of the Boston marginal conduit and Boston Embankment. Recommended by J. N. Ferguson, D. A. Ambrose, A. M. Lovis and A. E. Tarbell.

ELMER O. GOODRIDGE, Melrose, Mass. (b. 1862). Graduate of University of Maine, degree of M. E. in 1885. Summer and fall of 1885, assistant to city engineer, Bangor, Me.; April, 1886, to Dec., 1888, assistant engineer, Great Northern Railroad, Montana division; January, 1889, to October, 1892, in charge of steam plant and machine shops, Hampton Institute, Hampton, Va.; October, 1892, to May, 1893, student General Electric Co., Lynn, Mass.; May, 1893, to October, 1903, with Mass. Elec-

tric Co., chief engineer, power station and rebuilding power station; October, 1903, to date, master mechanic, Boston Rubber Shoe Co., Malden, Mass. Recommended by G. O. W. Servis, C. T. Fernald, H. S. French and C. H. Gannett.

**RICHARD KING HALE**, Brookline, Mass., (b. 1880). Graduate of Harvard College, (A. B.) in 1902, and of Mass. Institute of Technology, (S. B.) in civil engineering in 1904. Since 1904 has been an assistant engineer with Robert Spurr Weston during which time he has been resident engineer on concrete construction work of various kinds, as well as general engineering work. Recommended by Leonard Metcalf, R. S. Weston, C. W. Sherman and W. T. Barnes.

**ARTHUR WEBSTER HODGES**, Newton, (b. 1873). Graduate of the Lawrence Scientific School, Harvard College in 1897. Employed by Hodges & Harrington and later by E. Harrington & Co., Boston, for about three and a half years; for about three years was in business for himself, during which time was on railway and other engineering work, and since 1904 has been with the Boston & Northern and the Old Colony Street Railway Companies as first assistant engineer. Recommended by W. E. McClintock, C. W. Ross, E. E. Pettee and Gilbert Hodges.

**CHARLES ADAMS MIXER**, Rumford, Me., (b. 1859). 1879-81, assistant to County Surveyor, Butler Co. and City Engineer, Hamilton, O.; 1882, assistant engineer location and construction Michigan & Ohio Railroad, Allegan to Detroit; 1883, assistant engineer, location and construction, Rochester & Pittsburg Railroad at Dubois, Pa.; 1884, assistant engineer, Lehigh Valley Railroad terminals at Buffalo; 1885 to 1887, principal assistant design and construction, Walnut Hills and Vine St. cable roads, Cincinnati; 1888, principal assistant 15th St., Broadway and Colfax Ave., cable road, Denver; 1889, engineer in charge, College Hill cable road, Providence; 1890 to 1891, assistant in City Engineer's office, Providence, on Improved Sewerage System and Fruit Hill Reservoir repairs; 1892 to date, engineer in charge design, construction and maintenance of all civil, hydraulic and electric works belonging to and connected with the development of 54,000 h. p. on Androscoggin River at Rumford Falls, Me., including dams, canals, power and pumping stations, water supply, sewerage, streets, bridges, etc., and during the same time a dam and mill at Riley, additions to mills at Otis Falls, and the 320-foot span highway bridge at Livermore Falls, and some consulting practice. Recommended by W. H. Sawyer, R. S. Weston, Dwight Porter and H. K. Barrows.

**OREN ELISHA PARKS**, Westfield, Mass. (b. 1871). Graduate of Mass. Institute of Technology, 1893. With L. F. Thayer, civil engineer and surveyor at Westfield in 1893, and from 1894 to date has been town engineer and engineer of the Westfield Water Works and has had charge of the engineering work of the town for this period as well as a considerable amount of private engineering works, surveys, etc. Recommended by W. S. Johnson, F. H. Fay, F. A. McInnes and S. E. Tinkham.



FRANK CARLTON SARGENT, Malden, Mass., (b. 1873). Went to work for the Thomson-Houston Electric Co., Lynn, in 1890, expert department, on various kinds of electrical work for one year; on road (erecting) for one year, assistant engineer in alternating current department two years; five years on the road starting up new equipments of plants and investigating troubles; with the Malden Electric Co. in 1899 as chief electrician. Has been with this company and allied companies up to the present time, and is at present electrical engineer for the Malden Electric Co., the Haverhill Electric Co., Suburban Gas & Electric Co., Fitchburg Gas & Electric Light Co. and Concord Electric Co. Has done outside engineering for other companies, particularly the engineering for the 33,000-volt plant at Houlton, Me. Recommended by D. A. Harrington, E. S. Larned, Sidney Hosmer and I. E. Moulthrop.

#### AS AN ASSOCIATE.

JAMES GRANGER LINCOLN, Brookline, Mass., (b. 1859). Graduate of Brown University 1880, degree of A. M. in 1883. With Waldo Brothers, Boston, since 1880. Recommended by J. R. Worcester, L. C. Wason, F. A. Barbour, S. E. Tinkham and W. L. Miller.

# MINUTES OF MEETINGS.

## ANNUAL MEETING OF THE SOCIETY.

BOSTON, MARCH 17, 1909. — The annual meeting of the Boston Society of Civil Engineers was held at the Boston City Club, 9 Beacon Street, at 11 o'clock A.M., President Joseph R. Worcester in the chair. About one hundred and fifty members and visitors present.

The record of the last regular meeting was read and approved.

The President announced that in compliance with the vote passed at the last meeting he had appointed Messrs. George B. Francis, Leonard Metcalf and Dexter Brackett a committee to coöperate with the local members of the American Society of Civil Engineers on arrangements for the annual convention of that society, to be held at Bretton Woods, N. H., in July next.

The President also announced that he had appointed Messrs. George H. Brazer and Wilbur W. Davis as tellers to canvass the ballots for officers for the ensuing year.

Messrs. Clayton R. Elkins, Herman W. French, Arnold W. Heath, Dugald C. Jackson, Granville Johnson, Lewis E. Moore and Ernest C. Willard were elected members of the Society.

The Secretary read his annual report and, on motion, it was accepted and placed on file.

The President read the annual report of the Board of Government and, on motion, it was accepted and placed on file.

The Treasurer read his annual report and, on motion, it was accepted and placed on file.

Mr. Loud, for the Committee on Excursions, presented and read its annual report, which was accepted and placed on file.

The Librarian read the annual report of the Committee on the Library and, on motion, it was accepted and placed on file.

Mr. FitzGerald made a verbal report for the Committee on Quarters.

Mr. Cowles, for the Committee on Larger Membership and Club House, submitted a report on the establishment of a bureau of registration and a broader and more specific classification of membership. The report was accepted and placed on file.

On motion of Mr. Curtis it was voted to refer to the Board of Government with full powers the question of appointing the special committees of the Society and the selection of the members thereof.

It was voted to appropriate the sum of \$50 for the purchase of new reference and text-books during the coming year.

On motion of Mr. Sherman, the matter of providing assistance for the Secretary, as suggested in the annual report of the Board of Government, was referred to that board with full powers. It was further voted, on motion of Mr. FitzGerald, that it was the sense of this meeting that it would be a wise thing to provide some assistance to the Secretary.

The recommendations and suggestions of the Committee on Larger Membership and Club House were referred to the Board of Government with full powers.

The consideration of the report of the Committee on Larger Membership and Club House, submitted at the February meeting, was then taken up.

After a full discussion it was finally voted, on motion of Mr. Johnson, that it is the sense of this meeting that the Society should adopt some plan of procedure similar to that of the committee's Scheme 3. The vote was 48 Yes and 9 No.

On motion of Mr. Bryant, it was voted: That the Board of Government and the Committee on Quarters, with the special Committee on Larger Membership and Club House, be requested to definitely formulate a plan along the lines of Scheme 3, and that the Board of Government be authorized to expend such funds to that end as may be required, it being understood that the cost of the proposed scheme should not exceed \$125 000 including land and building.

At the request of the President, Professor Hollis, chairman of the committee appointed by the Board of Government to consider the formation of a Mechanical Engineers' section, reported informally what the committee had done and stated that a report would soon be submitted to the Board of Government.

The consideration of the following amendments to the Constitution and By-Laws presented at the last meeting was then taken up.

Amend Article II of the Constitution by the addition of the following paragraph to follow the third paragraph as it now stands:

"Members in good standing who have retained their membership for thirty years may, by relinquishing their right to receive notices and publications of the Society, be relieved from further payment of fees, dues and assessments and still be retained on the roll of the Society as retired members."

Amend Section 7 of the By-Laws by adding thereto the following paragraph:

"Transfer of members to the retired list shall be made only by vote of the Board of Government."

After a discussion of the proposed amendment to the Constitution, on a vote being taken it was not adopted.

Consideration of the amendment to the By-Laws was then taken up.

Mr. Howe moved to amend the proposed amendment by substituting the following:

"The Board of Government may for such reasons as it may deem sufficient remit the dues in any current year of any member whom it may find to be unable to pay the same, no record to be made of the name of such member."

On a vote being taken the substitute was adopted.

A vote was then taken on amending the By-Laws by the addition of the proposed paragraph, and it was carried unanimously.

President Worcester then delivered the following address:

At the close of a year's service in this honorable position, it is fitting that the incumbent should take the Society into his confidence and give it the benefit of what he has gained by his experience.

It is perhaps inevitable that one's feelings should be tinged with a shade of disappointment. At any rate, that is the case in the present instance. It is natural for us to fall short of attaining our ideals and to have many regrets for failure to accomplish what we may have dreamed of. On this account it would be perhaps better if the President had a

chance to make his annual remarks earlier in his career, — as in the case of the American Society of Civil Engineers, while his hopes and aspirations are in their prime, and he has not yet reason to doubt of his power to fulfill them. In that case he would be spared the humiliation of confessing failures, and the character of his remarks would no doubt be more optimistic. On the other hand, if the President is learning, as he should be throughout his year of office, his advice, to be good for anything, ought to be invoked after rather than before he has been through the mill.

Then, again, while there have been disappointments, there have also been many satisfactions, and the tone of this confession should not be too dismal. The failures of one president can possibly be turned to some advantage if they lead to the avoidance of pitfalls by his successor.

Taking a general view of the status of the Society, it seems as if we had reached a turning point in our career. Looking back over our history, it would seem as if we were on the eve of a third chapter. The first chapter began sixty years ago and was of comparatively short duration, for the Society maintained meetings for a few years only. The second chapter began in 1874 with the formation of the "New Society" which was merged with the original one after the members learned of its innocuous existence. The second chapter has been vastly more successful than the first, but it seems to the speaker as if it had been subject, to some extent, to the same disease which put the first one out of commission, and which may require heroic treatment to extirpate unless taken in time. This disease is one very prevalent in organizations of this character. It is sometimes wrongly called dry-rot. It is certainly not that with us. It is an organic disorder of the reproductive functions.

For the perpetuation of the life of any society it is not only essential for new blood to be acquired fast enough to replace that of the men whose active interest flags, but for the control and management of the society to be in the hands of those whose interest is fresh. That this is not the case with us may be seen from the following statistics. Taking the officers of the Society for the last ten years, it appears that the average time that the presidents had been members of the Society at the time of their election was 23.1 years. The corresponding periods in the case of the other officers was as follows:

Vice Presidents.....	16.6 years.	Librarians.....	9.9 years.
Secretaries .....	25 years.	Directors.....	11.1 years.
Treasurers.....	24.5 years.		

This makes the average length of connection with the Society of the Board of Government between seventeen and eighteen years.

Is it according to human nature that men who joined the Society at about the time the new members were donning their first trousers can so direct the Society as to make it attractive to the newcomers? This was not so at the beginning of the chapter. Then the officers were contemporaries of all the members. This condition, in the nature of things, could not long continue, but there can be no doubt that as the disparity in ages between the officers and the new members increases there is grave danger of a lack of sympathy, which is of vital importance.

The speaker would be the last to reflect upon the value to the Society of the older members. The faithful attendance at the regular meetings of a few whose connection with us has lasted more than a third of a century is an inspiration to the younger members and an example of no little importance. Neither would we belittle the fact that but for the labor of love of some of our older officers it is hard to see how the Society could have continued to exist. At the same time it is probably true that it is during the first ten years of an engineer's connection with the Society that he is most apt to need its help and to be able to avail himself of it, and it is to those newer members that our meetings should be generally adapted. Can this be successfully accomplished without giving to the newer members a larger representation on the Board of Government?

Evidences of the restiveness of the younger element have been frequent during the past year. Some signs have appeared in the meetings of the Society, but more have been disclosed by the private conversation



with members which is a president's privilege. This restiveness indicates a transition period, and its results will be awaited with interest. The advice engendered by this experience is to adjust ourselves to the conditions, to give the younger element a show and to let them have their way whether it seems to our superior wisdom best or not.

The responsibility for the selection of officers should not be laid at the door of the older members alone. Our method of choosing officers would seem to give all an equal chance, and by taking a proper interest in the affairs of the Society the younger element would be much more likely to find places on the Board of Government, but, nevertheless, with our rules, it is nearly hopeless. The intention of the by-law with regard to the election of officers is to give a wide choice, and to remove any suspicion of political jobbery in the selection of candidates. No doubt it has accomplished this result, but its success has been attended with some disadvantages. The nomination of three candidates for every position, besides bringing the unpleasant sense of defeat to two thirds of the men voted for each year, has the effect of inevitably forcing the membership to make a choice between men of widely differing terms of service in the Society. The letter ballot does the rest of the evil. Those who vote, in a very large proportion, are men who seldom, if ever, attend the meetings. They do not know the younger members. In the list of candidates they are likely to find one whom they may know, or, at least, know by reputation, and they are pretty sure to vote for him. He may be the best man for the position, but he is more likely to be one whose professional advancement has made such demands upon his time that he has lost touch with the Society, and, in taking it up at a personal sacrifice, cannot readily acquire the spirit of the younger element. In many organizations there may be great danger in allowing those in control to have any part in the selection of their successors, but in our Society it is open to question whether the officers do not know better who should follow them than the membership at large. This may be going to the other extreme, and probably no such method of selection would be tolerated. It would be well to consider, however, whether it would not be wise to leave it to the discretion of the Nominating Committee how many names should be submitted for each office, but requiring them to include in the list names presented to them in writing by (say) any twenty-five members of the Society. The letter ballot with more carefully selected nominees would be robbed of its evils.

The most disappointing circumstance connected with the past year has been the failure to render the meetings attractive to the bulk of our membership. The character of the papers presented has been high, and the programs have been varied and comprehensive, but the attendance has often been a dismal failure. The speaker regrets that he has sought in vain for the explanation of this, and must turn the problem unsolved over to better hands. It appears from the attendance that it is not stereopticon illustrations nor is it instructive technical papers that the Society wants so much as descriptive accounts of work of general interest. We cannot doubt that the members value highly the technical papers, but they probably count upon being able to read them in print at their convenience and with leisure to digest them. This temptation is a strong one, and the speaker must plead guilty to having yielded to it frequently in the past. A year in the President's chair has the good effect of showing the incumbent his duty in this respect, for the attendance of past presidents is very creditable. Each member should realize that it is of much importance, not only to himself, but to the Society as a whole, that he should hear the papers read at the meetings. Then only will he have a chance to ask questions of the author, and with our present method of publication discussion of subjects open to controversy or even demanding statements in reply is likely to be overlooked.

As an example of the danger of this lack of discussion, the Society has been severely criticised during the past year. In the fall of 1907 a paper was presented by an engineer interested in a certain system of water-proofing. The attendance at the meeting when the paper was presented was not large and did not include those who were prepared to answer the author and present the arguments on the other side. Several months later the paper appeared in the JOURNAL, with the usual invitation to



readers to present discussions. Those of the members who read it either felt that the subject was cold and that the time had gone by to take it up, or lacked the interest and inclination to take up cudgels. As a result it looked to the engineering profession as if the Boston Society accepted without remonstrance the statements made in the paper. Unless the members of the Society will fully discuss subjects presented, it looks as if the Board of Government must review all papers presented and make sure that they contain no heresy before allowing them to be read. This would be a deplorable result. In the speaker's judgment one of the chief duties of the Society is to bring out one-sided opinions and to offer a forum for their discussion. The consensus of testimony should be sane and safe.

A very valuable aid to producing a discussion would be the distribution of the papers in print before their presentation at the meetings. This, it may be confessed, was one of the speaker's plans which he has absolutely failed to accomplish. It would be possible to do this by means of the *Bulletin*, at a minimum of expense, by arrangement with the Association of Engineering Societies. The papers could be put in type in advance by the press which publishes the *JOURNAL*, and electrotype plates could be prepared at a small cost, which could be used in the preparation of the *Bulletin*. The additional cost would be little more than the extra paper and sometimes postage, and these should be offset by the increase in advertising value. The trouble is that it seems almost impossible to secure the copy of the papers in advance of the meetings. In fact, it is often hard enough to get it for months after presentation. The coöperation of all members is essential for the success of this project.

The offering of papers by members is not as free as it should be. It ought not to be necessary for the officers to solicit papers, but they should be voluntarily tendered. Americans might well learn a lesson from our European friends in this respect. There it seems to be the regular custom for engineers to lay before the public their accomplished works as well as the results of their researches, and this is the true professional spirit. Here, on the other hand, there seems to be a tendency to withhold one's thoughts as long as possible. In so far as this tendency is based upon desire for exclusive use of an invention it is unethical and unprofessional. In so far as it is due to modesty, it is mistaken. In either case, it is bad policy from the standpoint of the author, and an unnecessary injury to the Society.

The most hopeful and pleasing developments of the year have been the unvaried and unwavering support that has been accorded the President by his associates on the Board of Government, and the earnest, helpful interest in the Society of many of its members. These features will always remain a delightful memory.

At the conclusion of the address the tellers of election submitted their report, giving the result of the letter ballot. In accordance with the report, the President announced that the following officers had been elected:

President — George B. Francis.  
Vice-President (for two years) — Charles T. Main.  
Secretary — S. Everett Tinkham.  
Treasurer — William S. Johnson.  
Librarian — Frederic I. Winslow.  
Director (for two years) — Frederic H. Fay.

The meeting then adjourned to partake of the twenty-seventh annual dinner which was served in the auditorium of the Club House. The attendance at the dinner was 160 members and guests.

After the dinner President Worcester again called the meeting to order and in a very happy manner introduced the president-elect, Mr. George B. Francis.

Mr. Francis thanked the members for the great honor they had conferred upon him and alluded particularly to the fact that, as he was a non-resident member, he appreciated even more highly his election. He

then gave a very interesting talk on "Railroad Terminals," which was fully illustrated by lantern slides. The talk included a history of the terminal problem in the city of Providence, R. I., and descriptions of terminals in many cities in this country and abroad.

At the conclusion of the talk the annual meeting was adjourned.

S. E. TINKHAM, *Secretary*.

The smoker held in the evening in the auditorium of the Boston City Club was an occasion thoroughly enjoyed by the two hundred and fifty or more persons present, and it contributed so largely to the spirit of sociability and good fellowship that the hope was generally expressed that the Society might have such gatherings regularly in the future. Ample opportunity was afforded for greeting old and making new acquaintances. After partaking of light refreshments, during which time music was provided by an orchestra, the greater part of the evening was given to the singing of old-time songs as well as new songs written for the occasion by some of the members and containing local hits. The smoker was a fitting ending of the most successful annual gathering in the history of the Society.

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The following list contains the names of members who registered as being in attendance at the Annual Meeting. The list is not complete, as some members failed to register, and it does not contain the names of all guests. Total attendance of members and guests at the various functions is estimated at 275.

ADAMS, E. P.	BRACKETT, DEXTER	COWLES, L. S.
ADAMS, H. S.	BRAZER, G. H.	CUNNINGHAM, J. E.
ALLBRIGHT, E. F.	BREED, C. B.	CURTIS, R. E.
ALLARDICE, E. R. B.	BROCK, N. S.	CUTTER, C. R.
ALLEN, C. E.	BROOKS, J. A.	DAVIS, E. S.
ALVORD, H. B.	BROOKS, FRED.	DAVIS, W. W.
AMBEROSE, D. A.	BROWN, A. F.	DEAN, A. W.
ATWOOD, JOSHUA, 3d.	BRYANT, H. F.	DEAN, LUTHER
BAILEY, F. S.	BUFF, L. F.	DORR, E. S.
BARBOUR, F. A.	BULLOCK, W. D.	DROWNE, H. B.
BARNES, W. T.	BUTCHER, W. L.	EATON, J. H.
BARROWS, H. K.	CARPENTER, G. A.	EDDY, H. P.
BARTLETT, ARTHUR	CARTER, F. H.	ELLIS, J. W.
BARTLETT, C. H.	CARTY, J. E.	EMERSON, G. C.
BATEMAN, L. H.	CHADWICK, H. M.	EMERSON, G. D.
BENOIT, A. W.	CHASE, J. C.	EVANS, R. R.
BIDWELL, L. B.	CHURCHILL, W. W.	FAY, F. H.
BLANCHARD, A. H.	CLAPP, O. F.	FELTON, B. R.
BLISS, H. R.	CLARK, C. S.	FERGUSON, J. N.
BOLLING, G. E.	CLARK, G. A.	FERNALD, C. T.
BOURNE, F. B.	COBURN, H. L.	FITZGERALD, D.
BOWERS, GEORGE	COOK, M. T.	FLETCHER, A. B.

- FOSS, CLIFFORD  
 FOX, BENJAMIN  
 FRANCIS, G. B.  
 FRENCH, A. H.  
 FRENCH, H. W.  
 FULLER, A. D.  
 FULLER, F. L.  
 GANNETT, C. H.  
 GARROD, J. A.  
 GAVETT, A. J.  
 GERRY, L. L.  
 GOODNOUGH, X. H.  
 GOULD, J. A.  
 GOWING, E. H.  
 GUNBY, F. M.  
 HAMILTON, G. W.  
 HAMMATT, E. A. W.  
 HAMMOND, W. B.  
 HARKNESS, G. E.  
 HARRINGTON, D. A.  
 HARRINGTON, E.  
 HARTWELL, H. C.  
 HARTWELL, O. W.  
 HASKELL, E. A.  
 HASTINGS, L. M.  
 HAWLEY, W. C.  
 HAYES, J. H.  
 HAZARD, T. G., Jr.  
 HEWS, J. R.  
 HOGUE, C. J.  
 HOLLIS, I. N.  
 HOLMES, J. A.  
 HOOKER, G. F.  
 HOWARD, J. L.  
 HOWE, E. W.  
 HOWLAND, A. H.  
 HOUGHTON, C. E.  
 HUNTINGTON, F. W.  
 JOHNSON, W. S.  
 KEARNS, W. F.  
 KENT, WILLARD  
 KIDD, A. L.  
 KIMBALL, G. A.  
 KING, G. A.  
 KNOWLTON, C. F.  
 LARNED, E. S.  
 LEARNED, W. F.  
 LEDDER, G. G.  
 LELAND, G. I.  
 LIBBEY, J. H.  
 LOUD, R. W.  
 LOVIS, A. M.  
 LUTHER, H. B.  
 MAIN, C. T.  
 MANLEY, HENRY  
 MANLEY, L. B.  
 MARBLE, A. D.  
 MARSTON, F. A.  
 METCALF, LEONARD  
 MILLER, H. A.  
 MINER, F. M.  
 MILLER, W. L.  
 MOORE, L. E.  
 MORPHY, L. G.  
 MORSE, C. F.  
 MORSE, W. P.  
 MOSES, E. M.  
 MOSES, J. C.  
 MOTT, W. E.  
 MURRAY, F. L.  
 MCCLINTOCK, W. E.  
 MCCORKINDALE, R. I.  
 MCCUE, H. M.  
 MCINNES, F. A.  
 McNULTY, J. M.  
 NEGUS, A. L.  
 NORWOOD, E. A.  
 O'BRIEN, J. H.  
 OLIN, E. R.  
 PARKER, A. W.  
 PEARSON, C. A.  
 PEASE, C. H.  
 PENARD, T. E.  
 PETTEE, E. E.  
 PLIMPTON, A. L.  
 PORTER, DWIGHT  
 PRATT, H. B.  
 RABLIN, J. R.  
 READ, R. L.  
 RICE, R. E.  
 ROBBINS, A. G.  
 ROBINSON, L. C.  
 ROSS, C. W.  
 ROURKE, J. J.  
 SAMPSON, G. T.  
 SANBORN, M. F.  
 SAVILLE, CHARLES  
 SAWTELL, H. E.  
 SCOULER, D., Jr.  
 SEAGRAVE, ARNOLD  
 SEMPLE, W. J. C.  
 SHERMAN, C. W.  
 SMALL, GILBERT  
 SMITH, M. B.  
 SNOW, F. A.  
 STIFF, H. T.  
 STONE, J. E.  
 STRADLING, D. W.  
 STREET, L. L.  
 SWAIN, G. F.  
 TARBELL, A. E.  
 TAYLOR, L. A.  
 THOMPSON, S. E.  
 THORNDIKE, S. H.  
 THORPE, L. D.  
 TIGHE, J. L.  
 TINKHAM, C. S.  
 TINKHAM, S. E.  
 TREFETHEN, E. M.  
 TUCKER, J. I.  
 TURNER, F. E.  
 TURNER, C. C.  
 VESPER, R. A.  
 VANRENSSELAER, A.  
 WASON, L. C.  
 WESTCOTT, F. T.  
 WESTON, R. S.  
 WETHERBEE, G. H., Jr.  
 WHITNEY, F. O.  
 WHITNEY, H. L.  
 WHITNEY, W. C.  
 WHITTET, R. M.  
 WILEY, W. T.  
 WINSLOW, C.-E. A.  
 WINSLOW, F. J.  
 WOOD, D. M.  
 WOOD, F. J.  
 WOOD, H. B.  
 WOOD, I. S.  
 WOODFALL, J. L.  
 WOODS, H. D.  
 WORCESTER, J. R.

## GUESTS

ANEBUSKE, CARL,	KILLAM, S. E.,	REARDON, D. J.,
ASHTON, H. H.,	LINCOLN, J. G.,	ROGERS, E. H.,
BABCOCK, E. J.,	LLOYD, T. P.,	SARGENT, E. C.,
BENOIT, O. A.,	LOWE, I. M.,	SHERMAN, E. C.,
BOYER, E. D.,	MANNING, J. H.,	STURTEVANT, C. W.,
BREARE, H. B.,	MARSH, R. O.,	SULLIVAN, J. H.,
CLAPP, F. O.,	MILLER, C. A.	TORNES, P. A.,
DAVIS, R. B.,	OSBORNE, J. F.,	TREMERE, B. B.,
DAVISON, F. M.,	PARKS, O. E.,	WADE, E. C.,
DUDLEY, G. L.,	PLIMPTON, H. P.,	WEBBER, HARRY,
FLAHERTY, H. W.,	PRESCOTT, S. C.,	WEEKS, C. L.,
FRANCIS, H. N.,	PRESTON, JOHN,	WELLINGTON, W. O.,
HALE, R. K.,	PRIEST, R. P.,	WING, W. W.,
HODGES, A. W.,	RIPLEY, H. L.,	WILMARTH, MARK,

ANNUAL REPORT OF THE BOARD OF GOVERNMENT FOR THE YEAR 1908-9.

BOSTON, MASS., March 17, 1909.

*To the Members of the Boston Society of Civil Engineers:*

In compliance with the requirements of the constitution, the Board of Government submits its report for the year ending March 17, 1909.

At the last annual meeting the total membership of the Society was 650, of whom 618 were members of the Society, 1 honorary member, 13 associates and 18 were members of the Sanitary Section only.

During the year the Society has lost a total of 36 members: 13 by resignation, 17 by forfeiture for non-payment of dues, and 6 have died.

There has been added to the Society during the year a total of 64 members in all grades; 58 have been elected and 2 reinstated to membership in the Society, and 4 have been elected to membership in the Sanitary Section. Two members, Joseph P. Davis and Erasmus D. Leavitt, have been made honorary members.

The present membership of the Society consists of 3 honorary members, 11 associates and 664 members, of whom 19 are members of Sanitary Section only; making the total membership 678.

The record of the deaths during the year is:

William V. Moses, died April 14, 1908.

Irving T. Farnham, died September 19, 1908.

George Edward Sleeper, died October 25, 1908.

Arthur W. Hunking, died November 12, 1908.

Charles D. Elliot, died December 10, 1908.

Timothy Guiney, died February 4, 1909.

At the time of his death, Mr. Farnham was a Director of the Society and Clerk of the Sanitary Section.

Nine regular and three special meetings of the Society have been held during the year. The average attendance at the regular and special meetings was 82, the largest being 164 and the smallest 25.

The following papers have been read at the meetings:

March 18, 1908. — William F. Williams, "The Abolition of Grade Crossings in New Bedford." (Illustrated.)



April 15, 1908. — George F. Swain, "Some Points in Connection with the Quebec Bridge." (Illustrated.) Memoir of Alfred E. Nichols.

May 20, 1908. — James E. Howard, "Some Causes which Tend Toward the Fracture of Steel Rails." (Illustrated.) Discussion by Prof. Henry Fay and members of the Society. Memoir of William V. Moses.

July 4, 1908. — Sixtieth Anniversary of Organization of Society. Addresses by President Joseph R. Worcester, Past Presidents William E. McClintock, Dexter Brackett, and Frank W. Hodgdon, and Messrs. George B. Francis and Morris Knowles. Subject: "Why do not Engineers take a more Prominent Part in Public Affairs?"

September 16, 1908. — Benjamin Fox and Sanford E. Thompson, "Notes on Driving Cast Reinforced Concrete Piles." (Illustrated.) M. M. Cannon, member of American Society of Civil Engineers, "Steamship Terminals at Brunswick, Ga., and Pier at Navy Yard, Charleston, S. C." (Illustrated.)

October 21, 1908. — Dr. Edward V. Huntington, of Harvard University, "A Study of the Motion of the Gyroscope, with Special Reference to the Brennan Mono-Rail Car." (Illustrated.) I. N. Hollis, "Application of Gyroscope to the Howell Torpedo."

November 18, 1908. — J. G. Callan, "The Small Steam Turbine Considered from an Engineering and Commercial Viewpoint." (Illustrated.)

December 11, 1908. — Meeting held at Boston City Club. Discussion of Report of Committee on Larger Membership and Club House.

December 16, 1908. — Frederic H. Fay, Charles M. Spofford and John C. Moses, "Boylston Street Bridge, Boston, from 1888 to the Present Time; the Destruction and Reconstruction of a Bridge Subjected to Locomotive Fumes and Increasing Car Loads." (Illustrated.)

January 13, 1909. — Desmond FitzGerald, "Principal Docks and Harbors of Europe." (Illustrated.)

January 27, 1909. — H. K. Higgins, "A Specification for Filing and Indexing Railroad Plans." Alfred D. Flinn, "The Filing and Indexing Systems of the Board of Water Supply of the City of New York." Herbert C. Hartwell, "The System of Indexing Plans used by the Boston Elevated Railway Company, in the Department of Elevated and Subway Construction." (Illustrated.)

February 17, 1909. — Henry M. Haven, "Mechanical Refrigeration and Some of Its Modern Applications." (Illustrated.)

Three informal meetings have been held in the Society's library during the year.

December 10, 1908. — Mr. Frederick S. Green, Vice-President of the Waterproofing Company of New York, "Hydrolithic System of Waterproofing." (Illustrated.)

February 10, 1909. — Municipal Engineers' Meeting. Lewis M. Hastings, "Location of Pipes and Conduits of Public Service Corporations." Frank O. Whitney, "Preparation of Plans for Assessment of Betterments in Boston and the Laws Governing the Same." Arthur Bartlett, "Method of Obtaining and Preparing Transfers of Property for Use in Assessors' Department."

March 10, 1909. — Austin B. Fletcher, "First International Road Congress."

The sixtieth anniversary of the foundation of the Society was observed in a most fitting manner by the excursion to Bretton Woods. The occasion attracted some of our members who are rarely able to attend the regular meetings in Boston, and the five days of close association resulted in friendships which ordinarily would not be formed in as many years. The attendance of the old guard of past presidents and their fraternal spirit towards the future presidents was perhaps the most delightful feature.

The library has continued to gain in value under the efficient management of the Librarian, and has been patronized to a considerable extent by



members. The Board recommends the continued appropriation for this purpose of as large a sum as can be spared.

The suggestion made at the last annual meeting that an effort should be made to make the Society more interesting to engineers residing in our vicinity was referred to a special committee, of which the originator of the suggestion was chairman. This committee has given faithful and earnest consideration of the subject and has presented two reports to the Society, including numerous and valuable recommendations. The Board of Government has endeavored to carry out these suggestions as far as possible, one resulting in the very enjoyable special meeting at the City Club in December, and another in the form adopted for the present annual meeting. Further benefit is to be expected from them in the future. The matter of the possible change in quarters being still under discussion, the Board renewed our lease of the present accommodations for a term of five years but with a proviso that the lease may be cancelled by either party before the expiration of the term upon a notice of six months.

The question of the formation of additional sections of the Society has been considered by the Board, and, in view of the success which has attended the Sanitary Section since its formation, there can be no doubt of the desirability of further development in this direction. A committee has been appointed to investigate the feasibility of organizing a Mechanical Section, but as yet the committee has not reported. In many ways a sectional meeting is more satisfactory than a general meeting. The members become better acquainted with each other, and the social atmosphere is more conducive to true fellowship. The varying programs presented at the general meetings attract, to some extent, different groups of members, but the result is that out of our ten regular meetings there may not be more than one or two which appeal particularly to any one man, and going to these only he would have little chance to become well acquainted with his fellow-members. If we had a number of sections, the number of general meetings might be reduced to three or four, which would be very largely attended.

The success of sections, however, it must be clearly understood, depends entirely upon the enthusiastic support of a few leaders. Without this leadership not only would it be difficult to organize a section, but impossible to maintain it. The Sanitary Section has been extremely fortunate in this respect, and great credit is due its officers.

The work of the Secretary has been gradually increasing from year to year, while the Society has been passively content to impose upon the good nature of our faithful member who has devoted unstinted time and patience to the carrying on of our business. The time has come when this situation must be immediately faced. The editing of the *Bulletin*, the sending out of frequent notices, the correspondence with members and others, the arrangements with stenographers and illustrators for meetings, the following up of authors to secure manuscripts and innumerable other matters would nearly fill the entire time of an assistant. Moreover, if we had an assistant, the other officers, the Treasurer, the Librarian, the Clerk of the Sanitary Section and others could make profitable use of a part of his spare moments. If, in addition, the Society could secure a permanent custodian of the rooms, who would be familiar with the library and could answer questions, we feel sure that the value of the rooms would be largely enhanced to members. This assistant need not be an engineer

and might be a woman. It would be best to have a stenographer and one familiar with bookkeeping. By allowing this person to take in outside work, the expense to the Society might be somewhat lessened, but undoubtedly we shall have to spend \$500 or \$600 per year more than at present, even if a portion of the present salary of the Secretary be devoted to the purpose.

For several years the current receipts have been just about sufficient to meet the necessary expenses, and the outlook for the future is that there will be no decrease in any of the items of our expense account. The Board recommends a full discussion of this subject, and that definite action be taken.

For the Board of Government,  
JOSEPH R. WORCESTER, *President*.

# ABSTRACT OF THE TREASURER'S AND SECRETARY'S REPORTS FOR THE YEAR 1908-1909.

## CURRENT FUND.

### *Receipts:*

Dues for 1908-1909.....	\$4 014.00	
Dues for 1909-1910.....	85.00	
Dues for 1888-89 and 1903-4.....	14.00	
Rent of rooms.....	1 000.00	
Advertisements.....	1 105.00	
Library fines.....	4.24	
Balance on hand, March 18, 1908.....	570.03	
		<hr/>
		\$6 812.27

### *Expenditures:*

Rent.....	\$2 010.00	
Lighting.....	36.30	
Association of Engineering Societies.....	1 329.50	
Printing, postage and stationery.....	1 544.16	
Salaries of Secretary, Librarian and Custodian....	550.00	
Reporting meetings.....	100.00	
Stereopticon.....	165.00	
Books.....	53.35	
Binding.....	145.20	
Periodicals.....	28.50	
Cleaning library.....	38.25	
Furniture and repairs.....	33.50	
Advertisements in JOURNAL.....	15.00	
Incidentals.....	32.94	
Insurance.....	8.88	
		<hr/>
		6 090.58
Balance on hand, March 17, 1909.....	\$721.69	
Amount to credit of Current Fund, March 18, 1908.....	590.03	
		<hr/>
Excess of receipts over expenditures during year.....	\$131.66	

PERMANENT FUND.

*Receipts:*

Fifty-eight entrance fees, Society .....	\$580.00	
Four entrance fees, Sanitary Section .....	20.00	
Interest on deposits .....	180.72	
Interest on bonds .....	456.00	
Subscription to Building Fund .....	100.00	
Merchants' Co-operative Bank, retired share .....	202.88	
Balance on hand, March 18, 1908 .....	1 519.58	
		<u>\$3 059.18</u>

*Expenditures:*

Merchants' Co-operative Bank, dues on shares...	\$300.00	
Volunteer Co-operative Bank, dues on shares....	300.00	
Workingmen's Co-operative Bank, dues on shares,	300.00	
Franklin Savings Bank, deposit .....	19.68	
Warren Institution for Savings, deposit .....	29.56	
Boston Five Cents Savings Bank, deposit .....	28.40	
Provident Institution for Savings, deposit .....	27.80	
Eliot Five Cents Savings Bank, deposit .....	22.06	
Institution for Savings in Roxbury, deposit .....	20.58	
		<u>1 048.08</u>
Balance on hand, March 17, 1909 .....		\$2 011.10

PROPERTY BELONGING TO THE PERMANENT FUND, MARCH 17, 1909.

Twenty-five shares Merchants' Co-operative Bank .....	\$3 304.76
Twenty-five shares Volunteer Co-operative Bank .....	3 561.25
Twenty-five shares Workingmen's Co-operative Bank .....	847.62
Deposit in Franklin Savings Bank .....	507.14
Deposit in Warren Institution for Savings .....	761.77
Deposit in Boston Five Cents Savings Bank .....	732.05
Deposit in Provident Institution for Savings .....	716.79
Deposit in Eliot Five Cents Savings Bank .....	568.24
Deposit in Institution for Savings in Roxbury .....	530.53
Republican Valley Railroad Bond, 6%, par value .....	600.00
Boston Elevated Railway Bonds, 4½%, par value .....	4 000.00
C. B. & Q. Railroad Joint Bonds, 4%, par value .....	3 000.00
American Tel. & Tel. Co. Bonds, 4%, par value .....	3 000.00
Cash on deposit .....	2 011.10
Total Permanent Fund .....	<u>\$24 141.25</u>
Amount of fund as per last annual report .....	22 455.02
Gain during the year .....	\$1 686.23

TOTAL PROPERTY OF THE SOCIETY IN THE POSSESSION OF THE TREASURER.

Permanent Fund .....	\$24 141.25
Current Fund .....	721.69
Total .....	<u>\$24 862.94</u>
Amount as per last annual report .....	23 045.05
Increase during year .....	\$1 817.89

## REPORT OF THE COMMITTEE ON EXCURSIONS.

*To the Members of the Boston Society of Civil Engineers :*

During the past year nine excursions have been made by the Society, as follows:

April 15, 1908. — Charles River Dam. Attendance, 42.  
May 20, 1908. — Washington Street Tunnel. Attendance, 74.  
June 12, 1908. — Newton, Riverside and Norumbega Park. Attendance, 54.  
July 3 to 5 (inclusive), 1908. — Bretton Woods, N. H. Attendance, 62.  
September 9, 1908. — Wonderland, Revere. Attendance, 27.  
September 16, 1908. — Charles River Dam. Attendance, 75.  
October 21, 1908. — Deer Island, Boston Harbor. Attendance, 31.  
November 18, 1908. — Northern Avenue. Attendance, 65.  
January 27, 1909. — General Electric Company's Works, Lynn. Attendance, 32.

Total attendance, 462; average attendance, 51.

The committee has continued to collect such data in regard to "new engineering work," in process of construction, as has been obtainable for publication in the *Monthly Bulletin* of the Society, and in the course of the year has contributed about forty-three pages of such information.

In September last Mr. E. M. Blake, who had served the committee well in the capacity of Secretary and Treasurer, was called away to the western part of the country and Mr. H. K. Barrows was appointed to fill the vacancy caused by his resignation.

The thanks of the committee are hereby extended to all persons who have rendered assistance of any kind, and the suggestion is offered that still further coöperation will be welcome and that all helpful suggestions will be gratefully received. It is especially called to your attention that in the matter of promptly sending reply postal cards regarding attendance on excursions, members can be of material assistance to the committee in charge.

The Treasurer's report, hereto appended, shows a balance in the hands of the committee of \$14.54.

Respectfully submitted,

E. E. PETTEE, *Chairman*,  
L. B. MANLEY,  
HAROLD K. BARROWS,  
RALPH W. LOUD, *Secretary*,  
*Committee on Excursions.*

BOSTON, MASS., March 17, 1909.

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## REPORT OF THE COMMITTEE ON THE LIBRARY.

The report of the Library Committee for the past year is herewith submitted.

The number of books added to the library has been 187 bound in cloth, and 212 in paper. Twenty-two volumes were purchased, the remainder being given to the library, 7 being the gift of Mr. Clemens Herschel. The total number of bound volumes now on the shelves is 6 445.

During the twelve months, 191 books have been loaned to members. Thirty volumes of municipal reports have been bound in cloth, pursuant to vote of the Society, each volume covering about twelve years.



A twelve-drawer plan case was purchased for the preservation of the government topographical sheets, now numbering several thousands. It is proposed to add more sections to this case as soon as means permit.

During the summer the books and shelves were thoroughly cleaned by the vacuum process.

Many of the old books have had to be rebound as the leather bindings were cracked and falling to pieces. These were rebound in art vellum.

A number of the gifts of Mr. Clemens Herschel have been bound in conformity with our agreement with him in accepting his donations. The committee recommends that the sum of \$50 be appropriated for the purchase of new reference or text-books during the coming year.

FREDERIC I. WINSLOW,  
MAYO T. COOK,  
WILLIAM T. BARNES,  
HENRY A. VARNEY,

*Committee.*

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#### REPORT OF COMMITTEE ON LARGER MEMBERSHIP AND CLUB HOUSE.

BOSTON, March 17, 1909.

*To the Members of the Boston Society of Civil Engineers:*

The Committee on Larger Membership and Club House begs leave to submit the following report:

At the special meeting of the Society held at the City Club on December 11, 1908, it was voted:

"That it is the sense of this meeting that a bureau of registration for members seeking employment or a change of position should be established by this Society, and that the Committee on Larger Membership and Club House be instructed to formulate a plan for the establishment of such a bureau and report the same to the Society."

Your committee has considered this matter, always realizing that the consummation of this idea must be attended by a minimum expenditure of time by the officials of the Society. It is suggested that a suitable two-drawer cabinet for 4 by 6-inch cards be purchased for this purpose. The exact method of filing has not been decided upon, but it would seem advisable to invite all members to file cards giving a brief synopsis of their engineering career. A list of the names of those seeking positions should be kept by the secretary or custodian so as to be readily accessible to those interested, the experience of the applicants to be filed in the card catalogue.

It is deemed an opportune time to call the attention of the Society to the apparent necessity and advantages of a broader and more specific classification of membership, covered by Article 2 of the Constitution.

It is believed that full membership in the Society should require higher qualifications in the way of experience and education, with possibly some minimum age limit to be determined. While the life of the Society depends to a large extent upon the addition of younger members, it is thought that some period of probation in the form of an intermediate grade should be required. The establishment of such a division, probably called "Junior Membership," would lend greater dignity to the Society, create an incentive to attain full membership by the younger men and give a value to full membership perhaps not now existing.



In the event of the Society looking with favor upon the establishment of a club house, briefly outlined in our previous report, it would seem desirable to consider making some provision for student membership, to include possibly only the upper classes of nearby technical schools, this class of membership to have possibly somewhat restricted privileges and smaller dues.

The advantages of this student membership to the student would be the opportunity of attending meetings, acquaintance and association with the older members, with whom perhaps they may be later connected in professional work, and the privileges of the library. The advantages to the Society would be the greater number of young and enthusiastic members, a large percentage of whom would probably desire promotion to the "Junior" grade, and to full membership in due time.

The following statistics concerning the membership and Permanent Fund of the Society may prove of interest.

Year.	Members.	Permanent Fund.
1899.....	484.....	\$9 253
1900.....	490.....	10 010
1901.....	500.....	12 788
1902.....	507.....	13 651
1903.....	509.....	14 999
1904.....	528.....	16 081
1905.....	592.....	17 614
1906.....	621.....	18 813
1907.....	635.....	20 058
1908.....	650.....	22 455
1909.....	678.....	24 141

Respectfully submitted,

LUZERNE S. COWLES,  
CHARLES B. BREED,  
GEORGE A. CARPENTER,  
RALPH E. CURTIS,  
EDWARD S. LARNED,

*Committee.*

#### REPORT OF THE EXECUTIVE COMMITTEE OF THE SANITARY SECTION.

At the annual meeting of the Section, held March 4, 1908, the reports of the committees for the preceding year were placed on file. The Committee on Run-off was continued, and Messrs. Arthur T. Safford and William S. Johnson were added to the committee. At this meeting a Committee on Collection and Tabulation of Sewerage Statistics was appointed and at the special meeting held on April 1 a committee of five was appointed to consider the subject of uniform specifications for the manufacture of vitrified sewer pipe. The Committee on Run-off suffered by the death of Mr. Irving T. Farnham, who was chairman of the committee. Mr. H. K. Barrows was appointed in his place at the December meeting.

On June 3 an excursion to Lawrence and Lowell was arranged. Arriving at Lawrence in the morning, the members visited the Experiment Station of the Massachusetts State Board of Health and later the new pumps and filters of the Lawrence Water Works. The party arrived

at the Vesper Club above Lowell in the early afternoon, and after dining spent an enjoyable period on the beautiful island belonging to the club. Of especial interest was the new suspension bridge across the Merrimac River. On the return to Lowell the party were shown the wells and pumping station of the Lowell Water Works.

The death of Irving T. Farnham, Clerk of the Section, during the summer was a great loss. Mr. Farnham was much beloved by his associates, who mourn that failing health caused his mind to temporarily lose its control, and in the darkness of that hour death came. The unceasing energy with which he attacked all his work was unsparingly used to promote the interests of this Section.

In October a regular meeting of the Section was held at the Boston City Club. Messrs. Gardner S. Gould and Raymond W. Parlin were elected members of the Section, and Robert Spurr Weston was elected Clerk. During the year the following papers have been presented:

March 4. "Water Power." By Arthur T. Safford.

April 1. "Alaska." By Geo. R. King.

October 7. "Sewage Disposal Works in England and Germany." By Harry W. Clark.

November 4. "Three Years on the Isthmus." By Dr. Sumner Coolidge.

December 2. "Some Anomalies in Modern Plumbing Regulations." By J. Pickering Putnam.

February 3. "Day Labor *vs.* the Contract System for Doing Municipal Work." By Harrison P. Eddy.

All the talks have been illustrated by lantern slides or diagrams and the interest and attendance have been good. Besides the members of the Section, Dr. Charles P. Chapin, Superintendent of Health, Providence, R. I.; Mr. David Craig, President of the Master Plumbers' Association, and Mr. James C. Coffey, Executive Officer of the Worcester Board of Health, have contributed to the discussion of the papers.

The attendance has been as follows:

Annual meeting.....	35
April meeting.....	46
June excursion .....	34
October meeting.....	40
November meeting.....	53
December meeting.....	33
February meeting.....	62

Exclusive of the June excursion the average attendance at meetings has been 45.

Your Executive Committee passes its work to its successor with the recommendation that efforts be made during the coming year to have the meetings take up practical phases of sanitary engineering work as much as possible, that they may attract municipal officers and practical operators of sanitary works.

For the Executive Committee,

ROBERT SPURR WESTON, *Clerk.*

BOSTON, MASS., March 3, 1909.

The Committee on Run-Off from Sewered Areas submits the following report of its work during the year 1908-9.

The committee has during the past year directed its attention chiefly to arousing an interest on the part of engineers in establishing gaging stations and securing data. To this end the committee has corresponded with a large number of engineers in various parts of the country, and as a result about thirty have expressed a desire to assist, although in many cases the necessary funds for the establishment of stations are lacking, and in other cases the necessary authority for the work cannot be secured from the city governments.

As yet five gaging stations in only five places have been actually established as the result of the work of the committee. These are at Newton, Mass.; Cambridge, Mass.; Lowell, Mass.; Pawtucket, R. I., and Ithaca, N. Y. Records of considerable value are being obtained from the first four of these stations, but as yet the records have not been collated. Records of gagings previously made have been received from Philadelphia, and the committee has been promised a valuable set of observations which were made at Gary, Ill.

While the stations already established will, if continued, furnish valuable data, it is very desirable that as many additional stations as possible be established, and the committee would urge the members of the Section to do all in their power to further this work in their immediate vicinity. The committee will be glad to aid in the establishment of stations by giving advice based on experience obtained in other places, and members of the committee will go over the ground with any who may wish such assistance.

At the beginning of the year the main society appropriated \$50 for the expenses of the committee, a part of which has been used for printing blank forms upon which returns of the investigations are to be made.

The committee suffered a great loss in the death of Mr. Irving T. Farnham, who served as chairman since its organization, and to whose efforts the undertaking of this work by the Section was largely due. Besides serving as chairman, Mr. Farnham contributed largely to the results which have so far been obtained by the establishment of stations in Newton, where he was city engineer.

Respectfully submitted,

G. A. CARPENTER, *Chairman,*

W. S. JOHNSON,

A. T. SAFFORD,

H. P. EDDY,

L. M. HASTINGS,

H. K. BARROWS,

H. J. HUGHES,

*Run-Off Committee.*

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BOSTON, MASS., March 2, 1909.

SANITARY SECTION, BOSTON SOCIETY OF CIVIL ENGINEERS:

*Gentlemen,* — Your Committee on "Manufacture of Sewer Pipe" submits the following progress report.

Early in its investigations your committee appreciated that, in an attempt to standardize such a commercial project as vitrified pipe, co-operation with the manufacturers as well as a study of current practice

among engineers was desirable. Following this idea letters were sent, bearing upon the subject, to manufacturers of sewer pipe in different parts of the country, to the secretary of the American Society for Testing Materials, and to engineers in different parts of the country, asking for copies of the specifications used by them.

A member of your committee met the representatives of the manufacturers assembled in New York and outlined its plans. The manufacturers appeared to favor the standardization of sewer pipe specifications, and promised to give the matter their careful consideration, and to communicate further with your committee. Various matters have, however, prevented definite action upon the part of the manufacturers up to the present time, but your committee is still hopeful of final success.

Specifications from prominent engineers in different parts of the country have been gathered and are now being collated and analyzed.

A bibliography of the subject has also been prepared.

Your committee is, therefore, unable to make final report at the present time, and asks to be continued.

Respectfully submitted,

F. A. BARBOUR.

E. S. DORR.

C. R. FELTON.

L. D. THORPE.

LEONARD METCALF, *Chairman.*

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BOSTON, MASS., February 23, 1909.

SANITARY SECTION, BOSTON SOCIETY OF CIVIL ENGINEERS, BOSTON, MASS.

*Gentlemen,*— Your Committee upon the Collection and Tabulation of Sewerage Statistics begs leave to report upon the work of the last year as follows:

The statistics secured for 1906 were presented in the form of a report, together with tabulations, upon May 8, 1908, and this report was subsequently printed in the JOURNAL OF THE ASSOCIATION OF ENGINEERING SOCIETIES, No. 5, Vol. XL, issued in May, 1908. Immediately following the publication of these data the committee undertook to secure the summaries for 1907. This work was completed and a report upon same, together with tabulations, was presented to the Section upon February 3, 1909. The Section voted to have it printed, and it has been forwarded to the Secretary of the Association of Engineering Societies.

In reviewing the work of the year it is interesting to note that Summaries of Statistics for 1907 have been received from 24 cities and towns not included in the tables for 1906. Summaries for 1907 were received from 48 municipalities, and the last water works statistics published by the New England Water Works Association in 1906 contained reports from but 43 municipalities. It would appear from this comparison that the work of the Sanitary Section has met with a reasonable degree of success.

It is very apparent from even a casual study of the statistics furnished that the records in many of the cities and towns are kept in a very different manner. It is encouraging to note, however, that a few officials have adopted this summary for use in their annual reports. The cities



thus reporting data in whole or in part, in accordance with the standard summary, are Cambridge, Newton, Waltham, Watertown and Worcester, Mass., and Providence, R. I. Your committee desires to urge upon the members of the Section, as well as upon engineers and city officials in general, the adoption of this summary, not only for the annual reports, but also for keeping the records of the office. If the system is once adopted it is likely to be continued and improved from time to time.

Attention is called to the fact that the statistics received for 1907 do not in all cases check up with those for 1906. Care should be taken to compare the statistics returned to the committee with those returned previously, so that no errors may creep in, and so that errors made in the past may be corrected.

In view of the incomplete data received, and also of the fact that undoubtedly the data given are not in all cases capable of correct interpretation, except by those who prepared them, it may very well be asked whether the value of the data obtained is sufficient to warrant continuing the work. Upon this subject it seems that the results accomplished to date might be summarized as follows:

1. It is apparent and has been pointed out very clearly to municipalities with which your committee has corresponded that data relating to sewerage and sewage disposal are very poorly kept as a rule.

2. A standard form for keeping and for publishing the data in question has been provided and some degree of success has attended the effort made for its adoption.

3. As much information as possible has been collected and published for two successive years, and the information thus placed at the disposal of engineers interested in this subject is sufficient at least to indicate to them the lines of inquiry which may be necessary to secure more reliable information should they individually care to make further investigation.

4. Your committee has taken the liberty of rearranging in tabular form certain of the more interesting data relating to the cost of maintaining sewers, which, together with other information taken from printed reports and published articles, have been included with the tables to be published in connection with the Summary for 1907.

5. The collection of these statistics furnishes a personal connection of no small value between the Section and the various superintendents and engineers directly in charge of the work. Many who do not take active part in the meetings are thus represented. The Section by thus extending its usefulness to as many individual members and non-members as possible will secure a growth and a character of the kind which comes only to the more progressive organizations.

Whatever criticism may be justly made of the value of the data obtained and published, it seems true beyond reasonable doubt that the effort thus far made has resulted in impressing upon some of the engineers and officials the importance of recording valuable data, and has furnished a standard form which can be used with some assurance that others working in a similar field are collecting comparable information. If the work should stop at the present time your committee fears that much of the good which has been accomplished by inducing various municipal officers to realize the value of keeping their data in better form would be lost; while, on the other hand, if the work is carried on for a time it is probable that the results would in more cases be permanent.



The work of collecting data for 1908 has been started and some material has already been received. If this work is to be continued, an effort should be made to publish the available material at as early a date as possible after the expiration of the year to which it applies. Should the Section decide to continue this work, your committee recommends the following changes in the form of summary adopted by the Section:

1. Provide a space for the signature, official title and address of the person furnishing statistics.

2. Add the question, "Is this form used in preparing the annual report of your department for publication?"

3. Add after Item 13, under "Collection," "Number of miles cleaned."

4. Add after Item 18, under "Collection," the item "Cost of maintaining sewer system exclusive of disposal works (including cost of flushing and cleaning sewers; cost of cleaning catch-basins; administration and unclassified expenses)."

5. Add a note properly referenced at the bottom of the last page as follows:

"State what 'repairs' and 'unclassified expenses,' under Maintenance and Operation, include."

6. That all the items included in the summary be numbered consecutively from beginning to end, instead of being numbered under each of several classifications.

Respectfully submitted,

HARRISON P. EDDY.

CHARLES SAVILLE.

BERTRAM BREWER.

## NEW ENGINEERING WORK.

(Under this head the Excursion Committee proposes to present each month a brief résumé of engineering work in progress in New England, as far as such information is readily obtainable. The assistance of members is desired, and items of interest will be gladly received. Such items are intended to include not only works of exceptional magnitude or containing novel features, but also engineering construction work of all kinds and all degrees of magnitude. Notes should be in the hands of the Committee not later than the 2nd Wednesday of each month. The thanks of the Committee are due to the members who have furnished data for the Bulletin.—FRANK H. CARTER, Secretary, Excursion Committee, 2 Central Square, Cambridge, Mass.)

**Commonwealth of Massachusetts.**—**CHARLES RIVER BASIN COMMISSION.**—*Work in Progress at the Dam and Lock.*—Placing stone and concrete masonry for the harbor wall and earth and gravel filling for the Dam.

*Boston Embankment.*—The contract for surfacing and completing a roadway from the Cambridge Bridge to Otter Street is being advertised, and some work is being done on completing the filling of the embankment as far as the outlet of the Back Bay Fens.

**METROPOLITAN WATER AND SEWERAGE BOARD.**—*Water Works.*—The work of laying a new 48-inch water pipe to reinforce the Water Supply to the Boston low service district, which was suspended at the close of last year, has been resumed. The work is now in progress at two openings on Beacon Street in Brookline, one near Summit Avenue and the other near Washington Street. The work is being done by contract.

**METROPOLITAN PARK COMMISSION.**—*Charles River Reservation.*—Contract has been awarded for grading, surfacing and other work for roadway in the Charles River Reservation from Arsenal Street to North Beacon Street, and work will begin immediately.

*Mystic River Reservation.*—The work of constructing tidal dam at Cradock Bridge, Medford, has been resumed and the work now in progress is the setting of tide gates, sluice gates and lock gates.

*Winthrop Parkway, Revere.*—The work of building to sub-grade, which requires depositing of about 40,000 cubic yards of filling material, is in progress.

**HARBOR AND LAND COMMISSIONERS.**—The contract for dredging the South River at Salem to make a depth of 8 feet at mean low water is nearly completed.

The work of dredging an extension of the anchorage basin near Savin Hill in Dorchester Bay is nearly finished.

At East Bay, Osterville, dredging inside the jetties is about completed, but dredging is to be continued outside of the jetties.

At Sesuit Harbor, East Dennis, the small stones for the core of the jetty are nearly all in place, and large stones are being placed for the facing.

Work of dredging to a depth of 23 feet at mean low water is now in progress over a small area opposite India Wharf, Boston Harbor.

**HIGHWAY COMMISSION.**—The only towns in which State highway work is in progress at present are Chilmark, Foxborough, Norton and Becket, with some finishing work on the State highway in West Roxbury.

**Boston Elevated Railway.**—**ELEVATED AND SUBWAY CONSTRUCTION.**—*Forest Hills Extension.*—The steel structure from just north of the Arborway and through Forest Hills Square, including the new station, is being covered with reinforced concrete so that the structure may harmonize in appearance with the heavy masonry arches on the existing steam railway location. This is an entirely new departure in this class of work and is of exceedingly intricate and difficult construction. Track construction is also under way on the balance of this structure outside of the locations above mentioned.

*East Cambridge Extension, Charles River Bridge.*—Nine of the ten piers under contract with Holbrook, Cabot & Rollins are entirely completed. The stone masonry is being constructed in the last pier and will probably be completed within the next month. This will leave three shore piers to be constructed, and it is probable that no further steps will be taken in the construction of this bridge until traffic is turned to the new dam.

*Forest Hills Station.*—The structural steel for the station is nearly erected, and work on the reinforced concrete platforms, track floor, etc., will be shortly commenced.

*City Square Station.*—The extensive alterations at this point are well under way, the trains are now running over the new south-bound location, and the shift to the new north-bound track should take place before May 1st. The ultimate changes will provide a much better alinement of track and also two side-track platforms suitable for 8-car trains.

*South Station.*—Radical changes are being made at this station. The present station building is to be removed, additional

entrance and exit stairs provided, and the platform extended about 165 feet towards Dewey Square. These changes will more than double the ticket selling capacity of the station and materially relieve the congestion on the elevated platform.

**Boston Transit Commission.**—It is expected that the Washington-Street Tunnel work in progress about April 15, 1909, will consist mainly of making the changes in the old Subway at Haymarket Square, and it is also expected that the contractor for the Tunnel under Beacon Hill will have begun work at the intersection of Phillips and Grove Streets.

**Manchester, Mass.**—Simpson Bros. are building a reinforced concrete reservoir at Manchester, Mass, which will have a capacity of 1,000,000 gallons. The structure is to be 72 feet in height from floor to roof, and 50 feet interior diameter and is to be covered with a Guastivino dome roof. It is built on top of a high hill to which it is very difficult to transport material. There is in operation a cable road over which it is proposed to transport about 1,600 tons of material. The floor of the reservoir is in place and the company is now working on the walls. The work was designed by the company on a competitive basis and will be completed about June 15th.

**East Boston, Mass.**—Foundations for a warehouse for the Boston Terminal Refrigerator Co. are being installed by Simpson Bros. at the Corner of Sumner and Orleans Streets, East Boston, Mass. This building has 170 feet front on Sumner Street, and 160 on Orleans Street, and will be nine stories in height, and of the "mushroom" type of reinforced concrete construction. Foundations are to be of concrete on spruce piles.

**South Boston, Mass.**—Simpson Bros. are installing concrete foundations for Nos. 1 and 2 Units in the Edison Power Station at L Street, South Boston. This involves cutting out a mass of concrete previously put in.

**Concord, Mass.**—CONCORD WATER WORKS.—*High Service.*—The High Service work commenced in the summer of 1908 was practically completed in December, 1908. This work has not yet been put into operation as there has been some delay in the erection of the pump, due to unavoidable circumstances.

*New Supply from Nagog Pond.*—At a recent Town meeting the Commissioners were authorized to construct a new pipe



line from Nagog Pond to furnish additional supply to the present system. Surveys are to be made at once and it is hoped that active construction may be started by July 1st.

**East Cambridge, Mass.**—The Alberthaw Construction Co. is starting the foundation work for the Carter's Ink Co. on First Street, East Cambridge. The excavating is being done by Cavanagh Bros. with a digging machine of interesting construction. The building throughout will be reinforced concrete with a somewhat elaborate front.

**Springfield, Mass.**—The L. N. Farnum Company are laying twelve miles of 42-inch steel lock bar pipe, starting at the Connecticut River, just across the highway bridge from Springfield, and progressing toward Westfield. About 8000 feet of this pipe is now in place in the town of West Springfield, all of which is at present uncovered while awaiting water test. The contractor has just resumed trenching and laying operations on a continuance of this work, and it will probably be possible during the month of April to observe the methods of trenching, laying and riveting, including special provisions that have been taken to prevent electrolysis along the line of the street railway tracks.

The contractors have installed a Page bucket excavator on a traveling derrick, and this will probably be in operation during April. A special coating has been devised for protecting this pipe.

The pipe line will be laid to Proven Mountain where a storage reservoir 288 feet by 320 feet is being constructed by the Baker Construction Company of New York. The reservoir is to be covered with groined arch roof construction carried on piers, and is to have inverted groined arch floor.

The contractors have installed an elaborate concrete and crusher plant and a large traveling cableway for handling materials.

A unique feature of this work is the use by the contractors of a traction road locomotive for hauling materials from the railroad siding to the work.

The filtration plant is being built by the Charles R. Gow Company and is located in Mundale, a part of Westfield, about six miles from the Westfield Station. This consists of 6½-acre units of groined arch construction and at this time is about 75% completed. It will be possible during the month of April to see some

of the filters cleaned out ready for filter materials and the last filter will be in process of construction showing the methods of form work and of handling and placing concrete.

In connection with this contract an earth dike 40 feet in height and 150 feet wide at the base is being constructed to impound water forming a sedimentation basin. The dike now lacks about 10 feet of its finished height.

The contract also includes the construction of five reinforced concrete buildings; three of which are filter entrances, one a regulator house and the other an office and laboratory building.

Next above the filters is located the contract of the F. T. Ley Co., who are constructing a tunnel 4 feet by 6 feet and approximately 4500 feet long extending from a point near the filters to the gorge of the Little River from which the supply is obtained. This tunnel has been holed through and at this time the concrete lining is being placed. The contractors are using steel forms for the concrete lining.

It will be possible during the month of April to pass through the tunnel to the Little River gorge, where a concrete diversion dam is being built by the same contractor to intercept the flow of the river and divert the water through the tunnel. The foundation of this dam was completed up to the bed of the river last fall and it is not as yet certain when operations will be resumed.

About ten miles above this last named point, Coleman Brothers have recently commenced operations on their contract for a large earth dam across a branch of the Little River which is to impound water for storage purposes. This dam will contain 135,000 yards of fill and is approximately 100 feet high. At the present time the contractor is stripping the dam site and excavating for the core wall trench. It is possible that by the 21st of April the steam shovel may be working on the borrow pits for the fill.

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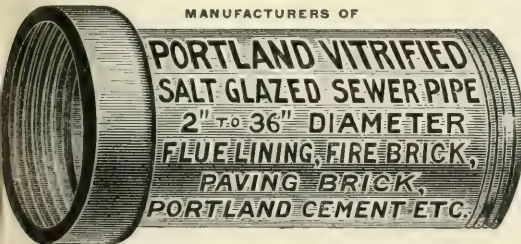
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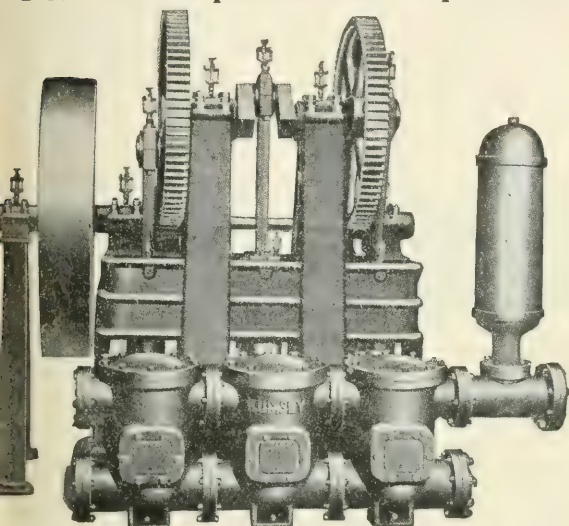
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The matter contained in this book is the result or elaboration of a series of lectures delivered to the engineering students of the University of Washington during several years past. The additional matter that has been added in the shape of forms of contracts, specifications and bank business forms will be found of advantage to both the student and the practising engineer, and it is believed that the entire work will be a valuable addition to the engineer's library.

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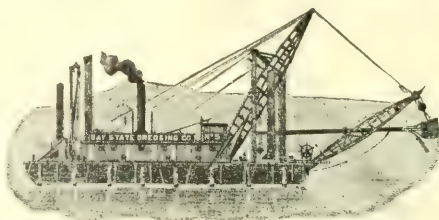
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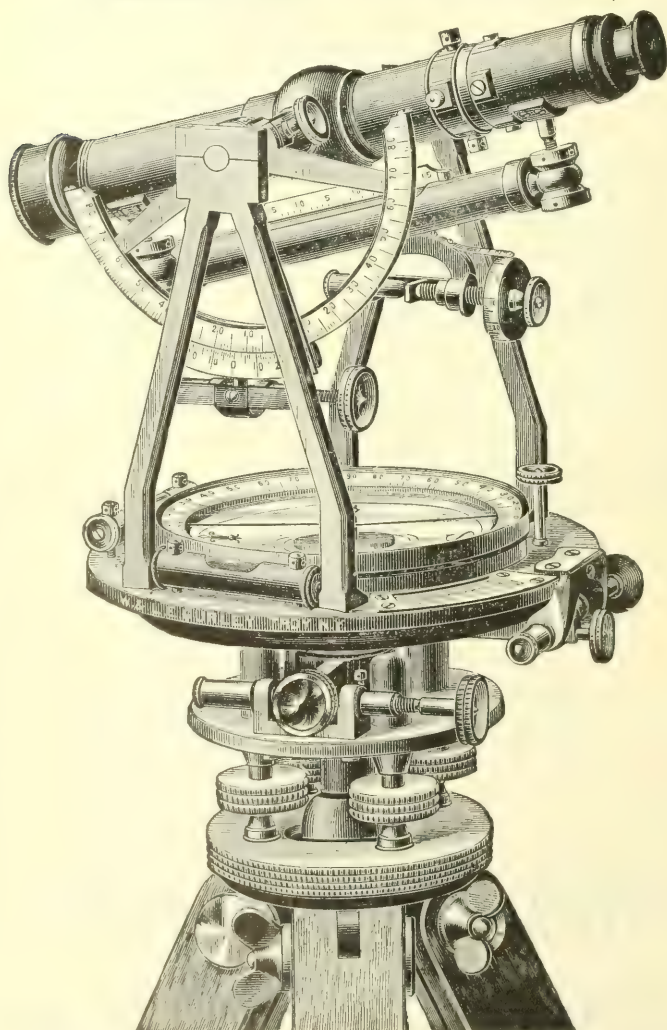
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
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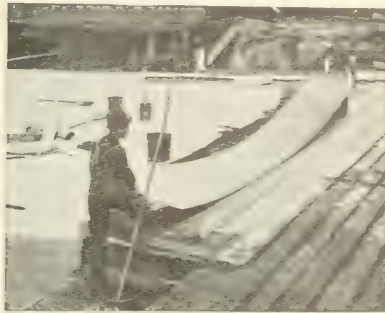
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# MONTHLY BULLETIN.

NEW SERIES.

MAY, 1909.

No. 32

## REGULAR MEETING.

A regular meeting of the Boston Society of Civil Engineers will be held on Wednesday, May 19, 1909, at 7.45 p. m., in

CHIPMAN HALL, TREMONT TEMPLE, BOSTON.

Mr. E. P. Dawley will read a paper describing the Railroad Tunnel recently built at Providence, R. I., for the N. Y., N. H. & H. R. R. The paper will be illustrated by lantern slides.

Mr. Dawley's paper is printed in this number of the *Bulletin*.

BUSINESS OF THE MEETING: To ballot on the applications for membership as announced in this notice.

The following vote, passed at the last meeting, will come up for action in accordance with By-Law 11:—

VOTED:— That the Board of Government be authorized to use the Permanent Fund for the purchase and equipment of a house for the Society.

The following amendment to the By-Laws, proposed in writing at the last meeting, will also be acted upon:—

Amend By-Law 10 by inserting in the first paragraph before the word "year" in the sixth and eighth lines the word "fiscal" so that the paragraph shall read:—

New members shall not be liable for the annual dues for the *fiscal* year in which they are elected, and, if elected after October 1, they shall be liable for only one-half of the annual dues for the ensuing *fiscal* year.

S. E. TINKHAM, *Secretary*.

## SPECIAL EXCURSION TO SPRINGFIELD, MAY 21-22, 1909.

An excursion will be made on Friday and Saturday, May 21-22, to Springfield, Mass., to visit the work now under construction for the Water Department of the City of Springfield, in the development of Little River as a source of water supply.



An invitation is cordially extended to members of the New England Water Works Association to join in this excursion.

A description of this work was given in the *Bulletin* for April, and is reprinted at the end of this notice. The essential features to be visited are as follows:—A 42-inch lock bar steel riveted pipe line some 12 miles long, extending between Springfield and Mundale (about 5 miles beyond Westfield). At Mundale is a sedimentation basin and about three acres of covered filters which will receive water from Little River by a tunnel 4,500 feet long, extending from a concrete diversion dam in the Little River gorge. About six miles from Springfield, on the pipe line, is the Proven Mountain storage reservoir.

Arrangements have been made for Cooley's Hotel, Springfield, as a rendezvous on Friday evening. Trains leave Boston at 4.30, 5.52 and 7.35 P.M., members procuring their own tickets. (The main party will leave at 7.35.)

The party will leave Springfield at 8 A.M., *sharp*, Saturday, in a special electric car. A stop will first be made opposite the Proven Mountain reservoir, about six miles from Springfield and a walk of a mile from the car line. Taking the car again about 10 A.M., the party will proceed to the vicinity of the golf links, about a mile beyond Westfield. Here a transfer will be made to barges, reaching the filters and sedimentation basin a little before noon. Lunch will be served here and several hours devoted to inspecting the works, including the diversion dam and tunnel. It is suggested that members provide themselves with rubbers and old clothes for use in the tunnel, which is liable to be wet. The steel pipe line will be visited at some time during the day, depending upon what portions are under construction at the time.

Barges will return to Westfield about 4 P.M., transferring to the special car and reaching Springfield about 6 P.M., the train for Boston leaving 7.14.

Expenses, exclusive of meals, about as follows:—

Railroad fare, Boston to Springfield and return .	\$4.00
Room at Cooley's Hotel . . . . .	\$1.00 to \$2.00
Electric car fare . . . . .	.50
Barge fare . . . . .	.50
Total from \$6 to \$7 per man.	

Members intending to go upon this excursion are *urgently requested* to notify the Secretary of the Excursion Committee

(Frank H. Carter, 2 Central Sq., Cambridge, Mass.), not later than Thursday, May 20th, so that the necessary hotel and barge accommodations may be secured. Members in the vicinity of Springfield who will not stop at Cooley's Hotel are especially requested to advise the Secretary of the Excursion Committee if they expect to be present.

*(Reprint from April Bulletin.)*

**Springfield, Mass.**—The L. N. Farnum Company are laying twelve miles of 42-inch steel lock bar pipe, starting at the Connecticut River, just across the highway bridge from Springfield, and progressing toward Westfield. About 8000 feet of this pipe is now in place in the town of West Springfield, all of which is at present uncovered while awaiting water test. The contractor has just resumed trenching and laying operations on a continuance of this work, and it will probably be possible during the month of April to observe the methods by trenching, laying and riveting, including special provisions that have been taken to prevent electrolysis along the line of the street railway tracks.

The contractors have installed a Page bucket excavator on a traveling derrick, and this will probably be in operation during April. A special coating has been devised for protecting this pipe.

The pipe line will be laid to Proven Mountain where a storage reservoir 288 feet by 320 feet is being constructed by the Baker Construction Company of New York. The reservoir is to be covered with groined arch roof construction carried on piers, and is to have inverted groined arch floor.

The contractors have installed an elaborate concrete and crusher plant and a large traveling cableway for handling materials.

A unique feature of this work is the use by the contractors of a traction road locomotive for hauling materials from the railroad siding to the work.

The filtration plant is being built by the Charles R. Gow Company and is located in Mundale, a part of Westfield, about six miles from the Westfield Station. This consists of 6½ acre units of groined arch construction and at this time is about 75 % completed. It will be possible during the month of April to see some of the filters cleaned out ready for filter materials and the last filter will be in process of construction showing the methods of form work and of handling and placing concrete.

In connection with this contract an earth dike 40 feet in height and 150 feet wide at the base is being constructed to impound water forming a sedimentation basin. The dike now lacks about 10 feet of its finished height.

The contract also includes the construction of five reinforced concrete buildings, three of which are filter entrances, one a regulator house and the other an office and laboratory building.

Next above the filters is located the contract of the F. T. Ley Co., who are constructing a tunnel 4 feet by 6 feet and approximately 4500 feet long extending from a point near the filters to the gorge of the Little River from which the supply is obtained. This tunnel has been holed through and at this time the concrete lining is being placed. The contractors are using steel forms for the concrete lining.

It will be possible during the month of April to pass through the tunnel to the Little River gorge, where a concrete diversion dam is being built by the same contractor to intercept the flow of the river and divert the water through the tunnel. The foundation of this dam was completed up to the bed of the river last fall and it is not as yet certain when operations will be resumed.

About ten miles above this last named point, Coleman Brothers have recently commenced operations on their contract for a large earth dam across a branch of the Little River which is to impound water for storage purposes. This dam will contain 135,000 yards of fill and is approximately 100 feet high. At the present time the contractor is stripping the dam site and excavating for the core wall trench. It is possible that by the 21st of April the steam shovel may be working on the borrow pits for the fill.

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## SANITARY SECTION EXCURSION.

The June excursion of the Sanitary Section will consist of a visit to the sewage disposal works of the City of Brockton where the newly constructed beds will be inspected. Conveyances will be provided to take the members and their guests from Brockton to Silver Lake, the source of water supply for the city of Brockton. If possible, dinner will be served out of doors. Provisions, however, will be made to take care of the party in case the weather is bad. At Silver Lake a new 6,000,000-gallon pumping engine is being erected. It is believed that the locality alone at this time of the year is sufficiently inviting to warrant a large attendance.

Ladies are invited. The members will be informed of the details of the arrangements when the notices are sent out, but it is probable that the party will leave the South Station at 9.08 A.M. and will return to Boston at 5.17 P.M.

ROBERT SPURR WILSON, *Clerk.*

## ANNUAL CONVENTION OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS.

The Board of Directors of the American Society of Civil Engineers has extended a cordial invitation to the members of the Boston Society of Civil Engineers to attend the annual convention of that Society to be held at the Mount Washington Hotel, Bretton Woods, N. H., July 6-9, 1909. Further information will be given in the June *Bulletin* or in a special circular.

### CANDIDATES FOR MEMBERSHIP.

To be balloted on at meeting May 19, 1909.

#### AS MEMBERS.

**HENRY BISSELL ALVORD**, South Weymouth, Mass. (b. 1885). Graduate of Mass. Institute of Technology in civil engineering, 1907. Has been employed as rodman, transitman and engineer's assistant in the last three successive seasons, with the Mass. Harbor and Land Commission, in work of town-boundary surveys under H. B. Wood. For the last two years has been employed at Institute of Technology as assistant in civil engineering. Recommended by C. F. Allen, H. B. Wood, W. C. Hawley and C. B. Breed.

**MOSES BURPPE**, Houlton, Me. (b. 1847). Began civil engineering experience in 1868 as rodman, Fredricton Railway, N. B.; later experience as draftsman, instrument man, etc., to 1870; then assistant locating and construction engineer, N. B. Railway, until 1887; 1879 to 1883, assistant engineer, C. M. & St. P. Railway and C. P. Railway; maintenance of way engineer, N. B. Railway and C. P. Railway, 1885 to 1891; and 1892 to date, chief engineer Bangor & Aroostook Railroad. Recommended by G. B. Francis, E. J. Beugler, L. W. Tucker and J. H. O'Brien.

**JOHN FRANCIS CALLAHAN, JR.**, Boston (b. 1884). Pursued courses in civil engineering at Harvard and Tufts for two and one-half years, beginning in the fall of 1904; entered the employ of the Boston Elevated Railway Co. in July, 1906, and was engaged in the construction of the Forest Hills Extension, topographical surveys, and preliminary work for East Cambridge Extension, until Oct. 31, 1906; on Nov. 1, 1906, entered the employ of the Charles River Basin Commission, and has been engaged up to the present time in the construction of the lock, dam and marginal conduit, and is still with that commission. Recommended by J. A. Holmes, J. L. Howard, J. N. Ferguson and H. M. McCue.



EDWIN PELEG DAWLEY, Providence, R. I. (b. 1853). 1872 to 1880, student, and afterwards assistant engineer on Providence Water and Sewerage Works; 1880 to 1882, engineer and superintendent, Interstate Telephone Co.; 1882 to 1892, engineer and chief engineer, New York, Providence & Boston Railroad Co.; 1892 to 1900, division engineer at Providence and Boston, assistant chief engineer at Boston, and engineer of construction at New Haven and Providence, for New York, New Haven & Hartford Railroad Co., and at present consulting engineer, with office in Providence. Recommended by G. B. Frances, J. W. Ellis, O. F. Clapp, W. D. Bullock and S. E. Tinkham.

RALPH WALDO EMERSON, Hingham, Mass. (b. 1876). Educated at Deering High School, Portland, Me. Manager, New England Telephone & Telegraph Co., at Hingham and Dedham, Sept., 1898, to April, 1904: rodman nine months with W. F. Whitman, Dedham, on surveys and sewer construction; rodman one year with Metropolitan Park Commission, largely on construction; rodman five months with Mass. Highway Commission, surveys and layouts; with Charles River Basin Commission, Sept., 1906, to date, first as rodman, afterwards promoted to instrument man, and now in charge of office works in connection with the construction of the Boston marginal conduit and Boston Embankment. Recommended by J. N. Ferguson, D. A. Ambrose, A. M. Lovis and A. E. Tarbell.

ELMER O. GOODRIDGE, Melrose, Mass. (b. 1862). Graduate of University of Maine, degree of M. E. in 1885. Summer and fall of 1885, assistant to city engineer, Bangor, Me.; April, 1886, to Dec., 1888, assistant engineer, Great Northern Railroad, Montana division; January, 1889, to October, 1892, in charge of steam plant and machine shops, Hampton Institute, Hampton, Va.; October, 1892, to May, 1893, student General Electric Co., Lynn, Mass.; May, 1893, to October, 1903, with Mass. Electric Co., chief engineer, power station and rebuilding power station; October, 1903, to date, master mechanic, Boston Rubber Shoe Co., Malden, Mass. Recommended by G. O. W. Servis, C. T. Fernald, H. S. French and C. H. Gannett.

RICHARD KING HALE, Brookline, Mass., (b. 1880). Graduate of Harvard College, (A. B.) in 1902, and of Mass. Institute of Technology, (S. B.) in civil engineering in 1904. Since 1904 has been an assistant engineer with Robert Spurr Weston, during which time he has been resident engineer on concrete construction work of various kinds, as well as general engineering work. Recommended by Leonard Metcalf, R. S. Weston, C. W. Sherman and W. T. Barnes.

ARTHUR WEBSTER HODGES, Newton, (b. 1873). Graduate of the Lawrence Scientific School, Harvard College in 1897. Employed by Hodges & Harrington and later by E. Harrington & Co., Boston, for about three and a half years; for about three years was in business for himself, during which time was on railway and other engineering work, and since 1904 has been with the Boston & Northern and the Old Colony Street Railway Companies as first assistant engineer. Recommended by W. E. McClintock, C. W. Ross, E. E. Pettie and Gilbert Hodges.

**CHARLES ADAMS MIXER**, Rumford, Me., (b. 1859). 1879-81, assistant to County Surveyor, Butler Co. and City Engineer, Hamilton, O.; 1882, assistant engineer location and construction Michigan & Ohio Railroad, Allegan to Detroit; 1883, assistant engineer, location and construction, Rochester & Pittsburg Railroad at Dubois, Pa.; 1884, assistant engineer, Lehigh Valley Railroad terminals at Buffalo; 1885 to 1887, principal assistant design and construction, Walnut Hills and Vine St. cable roads, Cincinnati; 1888, principal assistant 15th St., Broadway and Colfax Ave., cable road, Denver; 1889, engineer in charge, College Hill cable road, Providence; 1890 to 1891, assistant in City Engineer's office, Providence, on Improved Sewerage System and Fruit Hill Reservoir repairs; 1892 to date, engineer in charge design, construction and maintenance of all civil, hydraulic and electric works belonging to and connected with the development of 54,000 h. p. on Androscoggin River at Rumford Falls, Me., including dams, canals, power and pumping stations, water supply, sewerage, streets, bridges, etc., and during the same time a dam and mill at Riley, additions to mills at Otis Falls, and the 320-foot span highway bridge at Livermore Falls, and some consulting practice. Recommended by W. H. Sawyer, R. S. Weston, Dwight Porter and H. K. Barrows.

**OREN ELISHA PARKS**, Westfield, Mass. (b. 1871). Graduate of Mass. Institute of Technology, 1893. With L. F. Thayer, civil engineer and surveyor at Westfield in 1893, and from 1894 to date has been town engineer and engineer of the Westfield Water Works and has had charge of the engineering work of the town for this period as well as a considerable amount of private engineering works, surveys, etc. Recommended by W. S. Johnson, F. H. Fay, F. A. McInnes and S. E. Tinkham.

**FRANK CARLTON SARGENT**, Malden, Mass., (b. 1873). Went to work for the Thomson-Houston Electric Co., Lynn, in 1890, expert department, on various kinds of electrical work for one year; on road (erecting) for one year, assistant engineer in alternating current department two years; five years on the road starting up new equipments of plants and investigating troubles; with the Malden Electric Co. in 1899 as chief electrician. Has been with this company and allied companies up to the present time, and is at present electrical engineer for the Malden Electric Co., the Haverhill Electric Co., Suburban Gas & Electric Co., Fitchburg Gas & Electric Light Co. and Concord Electric Co. Has done outside engineering for other companies, particularly the engineering for the 33,000-volt plant at Houlton, Me. Recommended by D. A. Hartington, E. S. Larned, Sidney Hosmer and I. E. Moulthrop.

#### AS AN ASSOCIATE.

**JAMES GRANGER LINCOLN**, Brookline, Mass., (b. 1859). Graduate of Brown University 1880, degree of A. M. in 1883. With Waldo Brothers, Boston, since 1880. Recommended by J. R. Worcester, L. C. Wason, F. A. Barbour, S. E. Tinkham and W. L. Miller.

## APPLICATIONS FOR MEMBERSHIP.

The following applications for membership have been received and are now before the Board of Government for approval. Members having information which will assist the government in its consideration of these applications are requested to communicate at once with any member of the Board. Communications will be regarded as confidential and for the use of the Board alone.

### AS MEMBERS.

ROBERT BAYARD BELLAMY, Boston, (b. 1879). Graduated, B. S. degree, Trinity College, Hartford, 1901. In testing laboratory, Fore River Ship & Engine Co., Quincy, January, 1903, to August, 1903: transitman on railroad location in Central Pennsylvania, August, 1903, to February, 1904; with N. Y. & Long Island R.R. Co. on surveys and designs of 42nd Street subaqueous tunnel, May, 1904, to March 1905: on railroad location March, 1905, to August, 1905, in Central Pennsylvania; with N. Y. & L. I. R.R. on construction 42nd Street Tunnel, August, 1905, to August, 1906: assistant, Washington State Railroad Commission, August, 1906, to March, 1907: engineer at Kelley Mine, Kelley, New Mexico, April, 1907, to August, 1907; draftsman, El Paso & South Western R.R., August, 1907, to October, 1907: with International Boundry Survey, American Section, in charge of party on river topography along the Rio Grande, October, 1907, to March, 1908; traveling in Europe, April, 1908, to March, 1909. Recommended by R. A. Shailer, Fred Brooks, F. A. McInnes and L. L. Street.

HAROLD L. CARTER, Beaumont, Mass., (b. 1886). Graduate of the Mass. Institute of Technology class of '08, in mechanical engineering. Worked two summers during college course as traveling salesman, also two summers with H. P. Converse Company, Boston, structural steel and general contracting, and since graduation with the Inspection Department, Associated Factory Mutual Fire Insurance Companies, Boston, Mass. Recommended by Gaetano Lanza, E. F. Miller, W. E. Mott and Peter Schwamb.

CLIFFORD NELSON COCHRANE, Melrose, Mass., (b. 1884). Graduate of the Mass. Institute of Technology, class of 1908, in mechanical engineering. Worked two summers with Angus McDonald, Boston, contractor; one summer as assistant engineer with Morning Star Mining Company of Ophir, Colo., and since January, 1909, with Inspection Department, Associated Factory Mutual Fire Insurance Companies, Boston. Recommended by Gaetano Lanza, E. F. Miller, W. E. Mott and Peter Schwamb.

JOHN F. OSBORN, Cambridge, (b. 1873). Graduate of Harvard University, 1896, with degree of A. B., taking at same time many courses in mathematics and engineering. First employed with Mass. State Highway Commission as draftsman; later went more into mechanical line with Planters Compress Co., Agnew-Auto Mailing Co., American Pneumatic and Lamson Consolidated Service Co.; and is at present with Charles T. Main in the design of industrial plants. Recommended by C. T. Main, F. M. Gunby, H. E. Sawtell and L. S. Cowles.

EDWARD HENRY ROCKWELL, Somerville, (b. 1866). Graduate of Worcester Polytechnic Institute, 1890, S. B. in civil engineering. From fall, 1890, to August, 1891, with G. S. Morrison, C. E., Chicago; August, 1891, to September, 1893, with E. M. Rockwell, woolen business, Leominster, Mass.; September, 1893, to February, 1895, sub-master, Leominster High School; February, 1895, to April, 1897, with Norcross Bros., draftsman and engineer; April, 1897, to April, 1899, Supt. Holliston Yarn Co.; April, 1899, to September, 1900, draftsman Boston Bridge Works; September, 1900, to September, 1901, first-class structural draftsman Department Yards and Docks, designing; September, 1901, to September, 1902, engineer and estimator with Boston Bridge Works; September, 1902, to September, 1903, instructor in civil engineering at Tufts College; September, 1903, to Sept. 1906, asst. professor at Tufts College; September, 1906, to present time, professor of structural engineering, Tufts College; June to September, 1906, with Boston Bridge Works; June to September, 1907, asst. engineer Boston Transit Commission; and September, 1907, to present, consulting engineer for steel construction, Suffolk County Court House. Recommended by H. A. Carson, J. I. Tucker, D. W. Stradling, J. C. Moses and J. P. Snow.

JOHN BENJAMIN RUSSELL, Boston, (b. 1869). Graduate of Dartmouth College, class of '93, C. S. D., also degree of M. S., 1896. Seasons of 1893 and 1894, with U. S. Coast and Geodetic Survey; 1895, with French & Bryant, topographical survey work; January, 1896, to May, 1897, with B. & A. R.R., lines and grades, designs, &c., abolition of grade crossings in Newton; May, 1897, to December, 1897, engineering inspector in charge at Fort McKinley, corps of engineers, U. S. A.; January, 1898, to June, 1900, (except February and March, 1899,) with James P. McDonald Co., New York, engineers and contractors, employed in various positions on the construction of the Washington Co. Railroad, and Richmond, Petersburg and Carolina R.R. of Va.; and on the latter from October, 1899 to June, 1900, as principal asst. engineer of construction; and since June, 1900, with B. & A. R. R.; at present, resident engineer on reconstruction of East Boston terminals. Recommended by W. G. S. Chamberlain, Wm. Parker, H. D. Woods and H. F. Bryant.

EZEKIEL C. SARGENT, Quincy, Mass., (b. 1874). Graduated from Adams Academy, Quincy, 1893, and attended Massachusetts Institute of Technology, civil engineering course, 1894-96. Since July, 1896, has been in the employ of the City of Quincy and is now City Engineer of Quincy, Mass. Recommended by E. W. Branch, F. E. Tupper, F. H. Carter and L. S. Cowles.

ROBERT LEE WHIPPLE, Adams, Mass., (b. 1884). Was graduated from the University of Vermont in 1906, (B. S. of C. E.). Instrument man and resident engineer, South and Western R. R.; June, 1906, to August, 1907, assistant to City Engineer, Small Adams; and in private practice, August, 1907, to present time. Recommended by W. S. Johnson, F. S. Bailey, Charles Saville and X. H. Goodnough.



HARRY PERCIVAL WILSON, Medford, Mass., (b. 1882). Graduate of Tufts College in engineering, 1905; draftsman, Purdy & Henderson, May to July, 1905; Bridge shop, Eastern Bridge and Structural Co., August, 1905; Roebling Construction Co., draftsman, August, 1905-1906; asst. engineer, 1906-1907; in charge of designing steel and fire-proofing from 1907 to date. Is a Junior, American Society of Civil Engineers. Recommended by E. A. Norwood, C. A. Allen, J. I. Tucker, and F. T. Daniels.

## MEETING OF THE BOSTON SECTION, AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS.

A meeting of the Boston Section of the American Institute of Electrical Engineers will be held on Wednesday evening, May 19, 1909, at 8 o'clock, in the Auditorium of the Edison Electric Illuminating Company of Boston. This room is on the third floor of the new Edison Building, at 39 Boylston Street, Boston, between Tremont and Washington Streets.

Prof. E. E. F. Creighton of Union University, Schenectady, N. Y., will read a paper entitled "Demonstrations of Lightning Phenomena," which will be illustrated by experiments as well as by lantern.

A cordial invitation is extended to the members of the Boston Society of Civil Engineers to attend this meeting.

## LIBRARY NOTES.

### BOOK REVIEWS.

*Tables of Quantities for Preliminary Estimates.* By E. T. Hauch and P. D. Rice. 16 mo., iii + 92 pages. Cloth. \$1.25. John Wiley & Sons, New York. 1907.

Donated by the Publishers.

A small book of ninety-two pages, for Locating Engineers, containing tables used in preliminary work. Seventy-five pages are devoted to the tabulation of earth work quantities with natural surfaces varying from level to 35° slope, widths of road bed from 12 feet to 35 feet, and side slopes from one-half horizontal to one vertical to one and one-half horizontal to one vertical. Quantities are given to the nearest cubic yard per station of 100 feet.

The remaining pages present other tables of value to Locating Engineers, and the book is one which will serve a most useful purpose in preliminary railroad work.

Additional explanation and examples, indicating the use of the tables, might well have been inserted.

#### RECENT ADDITIONS TO THE LIBRARY.

##### State Reports.

Massachusetts Railroad Commissioners, Annual Report for 1908.

New York, Barge Canal, Report of Advisory Board.

##### City and Town Reports.

Beverly, Mass., Annual Report of Water Board, 1908.

Concord, N. H., Annual Report of Water Department, 1908.

Madison, Wis., Annual Report of Water Department, 1908.

Medford, Mass., Annual Report of Water and Sewerage Commissioners, 1908.

Newton, Mass., Annual Report of Water Commissioner, 1908.

North Adams, Mass., Annual City Report, 1908.

Northampton, Mass., Annual Report of Water Board, 1908.

Plymouth, Mass., Annual Report of Water Commissioners, 1908.

Taunton, Mass., Annual Report of Water Commissioners 1908.

Waltham, Mass., Annual Report of City Engineer, 1908.

Wellesley, Mass., Annual Report of Water Board, 1908.

Wilmington, Del., Annual Report of Water Commissioners, 1907 and 1908.

##### Miscellaneous.

Hammond's Atlas of the World.

Manuel of Re-inforced Concrete. Marsh and Dunn.

Engineering Contracts, 3rd edition. J. B. Johnson.

FREDERIC I. WINSLOW, *Librarian*

#### LIST OF MEMBERS.

##### ADDITIONS.

CHARLES E. ALLEN	37 St. Botolph St., Boston
HOWARD B. LUTHER	Mass. Inst. of Technology, Boston
ARTHUR I. NEGUS	76 East Wyoming Ave., Melrose, Mass.
HERBERT C. POORE	73 So. Central Ave., Wollaston, Mass.
ALDEN S. TILESTON	26 Tileston Place, Dorchester, Mass.

## MINUTES OF MEETINGS.

### APRIL MEETING OF THE SOCIETY.

Boston, April 21, 1909. — A regular meeting of the Boston Society of Civil Engineers was held at Chipman Hall, Tremont Temple at 7.50 o'clock P. M. President George B. Francis in the chair; 60 members and visitors present.

On motion, duly seconded, it was voted to dispense with the reading of the record of the annual meeting, inasmuch as it had been printed in full in the April *Bulletin*.

Messrs. Charles E. Allen, Howard B. Luther, Herbert C. Poore, Edwin H. Rogers, Willard C. Tannatt, Jr., and Alden S. Tileston were elected members of the Society, and Arthur I. Negus an associate of the Society.

The Secretary reported for the Board of Government that under authority of the vote passed at the Annual Meeting, referring to the Board, with full powers, the question of appointing the special committees of the Society and the selection of the members thereof, the following committees had been appointed:—

On Excursions: H. K. Barrows, Chairman; Frank H. Carter, Secretary; F. L. Murray, L. G. Morphy and H. L. Coburn.

On the Library: F. I. Winslow, L. G. Thorpe, H. T. Stiff, J. M. Siner and E. R. Olin.

On Permanent Quarters and Larger Membership: Desmond FitzGerald, E. W. Howe, J. R. Worcester, J. W. Rollins, Jr., L. S. Cowles, G. A. Carpenter, R. E. Curtis, C. B. Breed, E. S. Larned and J. H. O'Brien.

The Board also appointed the following to represent the Society on the Board of Managers of the Association of Engineering Societies, in addition to the Secretary who *is ex-officio* a member: Dexter Brackett, C. W. Sherman, G. A. Kimball, H. P. Eddy, A. T. Safford and J. R. Worcester.

The Secretary read a memoir of Timothy Guiney, a member of the Society, prepared by a committee consisting of Messrs. J. L. Howard and J. N. Ferguson.

The President announced the death of Lewis Frederick Rice, a past president of the Society, which occurred on April 12, 1909, and it was voted that a committee be appointed to prepare a memoir. The President has named as this committee Messrs. Joseph P. Davis and George S. Rice.

Mr. E. W. Howe, for the committee on Permanent Quarters, made a verbal report in relation to the property at 10 Ashburton Place, and as to its availability for a Society House.

The Secretary submitted a vote which had been prepared by the Board of Government and the Committee on Permanent Quarters, in joint session and which, if passed by the Society at two successive regular meetings, would render the permanent fund available for immediate use in the purchase of a Society House.

VOTED: That the Board of Government be authorized to use the Permanent Fund for the purchase and equipment of a house for the Society. On a vote being taken it was carried, 35 voting in the affirmative and 1 in the negative.

The Secretary offered in writing the following amendment to the By-Laws:

Amend By-Law 10 by inserting in the first paragraph before the word "year" in the sixth and eighth lines the word "fiscal" so that the paragraph should read:

New members shall not be liable for the annual dues for the *fiscal* year in which they are elected, and if elected after October 1, they shall be liable for only-one half of the annual dues for the ensuing *fiscal* year.

On motion of Mr. Barrows, the thanks of the Society were voted to Mr. James H. Hustis, Assistant General Manager of the Boston & Albany Railroad, and other officials of that Company for courtesies extended to the members of the Society on the occasion of the visit to the freight terminals of the Road at Allston and East Cambridge this afternoon.

Mr. E. B. Allardice was then introduced and read a paper entitled, "Reforestation of the Marginal Lands of the Wachuset Reservoir of the Metropolitan Water Works."

Mr. Arthur A. Shurtleff, Landscape Architect of Boston, followed with a very interesting account of the work that had been done by the Metropolitan Water Board and the Metropolitan Park Commission to preserve and improve the trees and forests in connection with their constructions.

Prof. Austin Cary described what had been done abroad, particularly in Germany, to preserve the forests, and Mr. Frank William Rane, State Forester, spoke briefly of the work the commonwealth had done toward preserving our forests.

The lantern was used to illustrate the paper and the descriptions of Messrs. Shurtleff and Cary.



After passing a vote of thanks to Mr. Shurtleff and Mr. Rane, who are not members of the Society, for their courtesy in being present and joining in the discussion, the meeting adjourned.

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Boston, May 5, 1900.—A special meeting of the Boston Society of Civil Engineers was held at Lorimer Hall, Tremont Temple, at 8.15 o'clock P. M., President George B. Francis in the chair and more than seven hundred members and visitors present.

The meeting was called to hear the latest information in relation to the Panama Canal and especially the results of the observations made by the Board of Engineers appointed to accompany President-elect Taft to the Isthmus, of whom three, Frederic P. Stearns, John R. Freeman and Allen Hazen, were members of this society. Unfortunately, Mr. Freeman who had expected to take part in the meeting was obliged to go South, but Mr. Stearns and Mr. Hazen were present and gave very interesting descriptions of the work at Panama.

Mr. Stearns devoted a large part of his time to a discussion of the type of canal which had been adopted, and replied to some of the criticisms which have been urged against a canal with locks.

Mr. Hazen spoke more particularly of the conditions of the people and the country in Panama. A large number of stereopticon views were shown to illustrate the remarks of both the speakers.

S. E. TINKHAM, *Secretary*.

## NEW ENGINEERING WORK.

(Under this head the Excursion Committee proposes to present each month a brief resume of engineering work in progress in New England, as far as such information is readily obtainable. The assistance of members is desired, and items of interest will be gladly received. Such items are intended to include not only works of exceptional magnitude or containing novel features, but also engineering construction work of all kinds and all degrees of magnitude. Notes should be in the hands of the Committee not later than the 2nd Wednesday of each month. The thanks of the Committee are due to the members who have furnished data for the Bulletin.—FRANK H. CARTER, Secretary, Excursion Committee, 2 Central Square, Cambridge, Mass.)

**Commonwealth of Massachusetts.**—**CHARLES RIVER BASIN COMMISSION.**—*Work in Progress at the Dam and Lock.*—Building harbor wall and placing earth and gravel filling for the dam.

*Boston Embankment.*—The work of surfacing the embankment is in progress from the Cambridge Bridge to Harvard Bridge, and the gaps in the Basin wall, through which the temporary overflows passed, are now being filled in.

**METROPOLITAN WATER AND SEWERAGE BOARD.**—*Water Works.*—The work of laying a new 48-inch water pipe to reinforce the Water Supply to the Boston low service district, which was suspended at the close of last year, is now in progress. The work is in progress at two openings on Beacon Street in Brookline, one near Summit Avenue, and the other near Washington Street. The work is being done by contract.

**METROPOLITAN PARK COMMISSION.**—*Charles River Reservation.*—Grading, surfacing and other work for roadway in Charles River Reservation from Arsenal Street to North Beacon Street is in progress.

*Mystic River Reservation.*—Work of constructing tidal dam at Cradock Bridge is nearly completed, and the work now in progress is that of setting tide gates, sluice gates and lock gates.

Proposals will be received on May 17, 1909, for surfacing and finishing drives along the Mystic River from High Street to Main Street.

*Winthrop Parkway.*—Work of completing to subgrade is in progress.

*Alewife Brook Purification.*—Proposals will be received on May 18, 1909, for dredging new channel for Alewife Brook, which requires the excavation of about 140,000 cubic yards of material.

HARBOR AND LAND COMMISSIONERS. — In Quincy Bay work is in progress enlarging the channel at Wollaston Beach, which is to be 60 feet wide on the bottom and 3 feet deep at mean low water.

The dredging of the channel at East Bay, Osterville, is in progress outside of the jetties.

At Sesuit Harbor, East Dennis, work is in progress on the construction of a stone jetty, the core of small stones being nearly completed and some of the large face stones placed.

HIGHWAY COMMISSION. — State highways are now under construction in the following cities and towns:—

Becket,	Foxboro,	Milford,
Boston (West Roxbury),	Holden,	Norton,
Dighton,	Lee,	Oxford.

**Concord, Mass.**—CONCORD WATER WORKS.—*New Supply from Nagog Pond.*—At a recent Town meeting the Commissioners were authorized to construct a new pipe line from Nagog Pond to furnish additional supply to the present system. Surveys are practically complete and bids are called for May 20th on  $3\frac{1}{2}$  miles of 16-inch cast iron pipe line, also intake 1800 feet long.

## THE EAST SIDE TUNNEL AND ITS APPROACHES, PROVIDENCE, R. I.

BY EDWIN P. DAWLEY, MEMBER AMERICAN SOCIETY CIVIL  
ENGINEERS.

*The Project.* — For over thirty years various projects have been considered for a practicable railroad connection for Fox Point, India Point and East Providence, with a union passenger station in Providence that would give a more convenient and commodious terminal for the important traffic on the eastern shores of Narragansett Bay from such centers as Warren, Bristol, Fall River and Newport. It was one of the important problems considered in the general scheme of improved terminal facilities at Providence, and the last link to be forged in the chain of construction that makes a complete union station.

All of the various projects suggested were either too round-about or too costly at the time for the one or two purposes which they would only inadequately have served. One such scheme, considered as far back as 1875, contemplated crossing the Seekonk River at Walker's Point, about half a mile above the highway crossing known as Red Bridge, and joining the main line of the railroads from Providence to Boston and Worcester at a point nearly two miles from the union station, the distance from Watchomoket Square in East Providence to the union station by this route being 7.75 miles, as compared with 2 miles by the East Side tunnel line.

Another route was by way of an elevated railroad from India Point, through South Water Street, crossing Market Square and Exchange Place near the present site of the new post-office and fire station, and entering the union station over Woonasquatucket River and Promenade Street bridges, just easterly of the station, which bridging when built was designed for such a future possibility. It was estimated that this route, which was approximately a mile long, would cost over a million dollars to construct.

A tunnel route was devised and advocated by the writer in 1894, but to the factor of large cost was added the undesirable operating features contingent upon steam locomotive service. In the light of present experience, it seems extremely fortunate both for the railroad and the community interests, that none of the earlier station projects with stub-end station buildings, and



none of the projects with station located a quarter of a mile further from the center of the city, and none that kept the tracks at a low grade with streets passing over the tracks, was adopted. Any of these projects would have been fatal to the construction of the present East Side tunnel.

The consolidation of the various railroad interests under one strong control, and the many advantages accruing from a tunnel over any other route, resulted in the reconsideration of the project on the broadest lines, giving due importance to present and future values and advantages; while the demonstration of the practicability of heavy electric traction has relieved the tunnel project of strong objections that might have been made against it some years earlier.

The new East Side tunnel, as constructed, while as costly as any of the earlier projects, was justified by the larger number of uses it will now serve. The general growth of population and business has, of course, helped materially to warrant carrying out what would have been too ambitious a project twenty years earlier.

*Benefits Derived.* — Some of the purposes which the new line can serve, and which, taken together, so well warrant its construction, may be summarized as follows:

*First.* All the railroad traffic from Newport, Fall River, Bristol, Warren and the entire east shore of Narragansett Bay can be brought directly into the center of Providence, thus making possible direct, all-rail connection to New York, and avoid former delay of transferring across the city from the station at Fox Point to the Union Station. The income from this service alone will to-day probably pay three quarters of the fixed charges on the required expenditure, and in five years the natural increase should take care of all fixed charges.

*Second.* A new short connection between the east and west side of Providence Harbor. The distance from the center of Providence to East Providence by the new line is 2 miles, as compared with 12.5 miles via Valley Falls, heretofore the shortest rail connection.

*Third.* A valuable new connection for both through passenger and freight business between Providence and Boston. The line gives opportunity for an additional double-track railroad from the union station, Providence, to East Junction, a distance of 9 miles, there joining former double track line from Providence

through Pawtucket. To provide two additional tracks on this former line, between the same points, would probably cost \$2 000 000. While such an outlay is not imperatively required for some years to come, a present expenditure of perhaps one third to one half such a sum toward the new East Side tunnel line may be considered warranted by the advantages offered for a new alternate Providence-Boston line.

*Fourth.* A good alternate line, in case of any blockade on old line between Providence and Pawtucket for all business from Worcester, Franklin, Boston and Taunton to Providence.

*Fifth.* A new, short, direct, convenient connection to the business center of Providence for both freight and passenger business for about 40 sq. miles of adjacent territory, naturally well fitted for manufacturing interests which just such a rail connection is sure to promote.

*Sixth.* The easier conduct of the heavy freight traffic now carried on along India Street, Providence, in connection with the several steamship lines to New York, Philadelphia, Norfolk and Baltimore. The removal of the very frequent passenger train service now carried on over a two-track drawbridge, in common with this freight traffic along India Street, will help out the freight work as much as it could otherwise be helped by the expenditure of nearly \$100 000.

In the foregoing statement little stress is laid upon prospective future increase. There are also several important services of a secondary nature included in and growing out of the six main items named that should within the next eight or ten years prove of one quarter to one third as much additional value as those specifically enumerated.

To summarize the general business warrant for this important piece of recent New England railroad construction, there is an immediate, mutual benefit accruing to both the interests of the communities served and the railroad that serves them; and an important link has been added to the railroad system of this vicinity that should have a very great influence upon early future advancement.

#### LEGAL AND RIGHT OF WAY MATTERS.

*Legislation.* — Under the enabling act of the Rhode Island Legislature, passed early in 1904, the "location, layout and construction" of the new line had to be commenced on or before

May 15, 1906, and the line completed on or before May 15, 1909. In addition to the usual general provisions in railroad charters in Rhode Island, certain special provisions were made, some of which may be of interest.

The title of the enabling act is as follows:

"An Act in amendment of and in addition to an Act entitled 'An Act to incorporate the New York, Providence and Boston and Old Colony Railroad Terminal Company,' passed by the General Assembly at its May session, A.D. 1891."

Section 4 of said act provides that "said tunnel shall be so located and constructed as not to interfere with the construction of any tunnel which shall have been theretofore authorized and approved by the city of Providence to secure better access to that portion of the said city lying easterly of North Main Street, Market Square and South Main Street, nor to impair the efficiency of any gas pipes, water pipes, sewers or conduits of any nature."

This provision with reference to interference with any tunnel that the city might desire to build proved academic, as no such tunnel was authorized. As a matter of fact there could be no practical interference with such a tunnel, which can readily be constructed at any future time.

Sections 16, 18 and 21 of the act are also quoted as containing special provisions of interest.

"SECT. 16. Nothing in this act shall authorize said company to condemn any portion of the location of any street railway company, or the surface of any highway, except for the purpose of crossing the same either above or below grade, and of maintaining suitable and convenient abutments and other supports for the structures erected or constructed for such crossing, nor to cross any highway or the tracks of any street railway company at grade."

"SECT. 18. The tunnel authorized by this act shall be so built and at all times kept in such condition that the surface of the ground above the same and in the neighborhood thereof shall not thereby be rendered infirm or unsafe for buildings thereon, and any failure of said company in this respect shall render it liable for damages to be recovered in an action of the case."

"SECT. 21. If said company shall fail to begin the location, layout, and construction of its said railroad as provided by Section 3 of this act on or before May 15, A.D. 1906, and complete the same on or before May 15, A.D. 1909, this act shall be void and of no effect, but the right of any person to recover

damages by reason of anything theretofore done by said company shall in no wise be impaired."

*Land Purchases.* — A large item of expense in this as in most extensive railroad improvements in the center of large cities was the cost of ownerships and easements acquired in real estate. A number of buildings devoted to business purposes on North Main and Canal streets were purchased, also fine valuable residences on Benefit, Thomas, Congdon and Angell streets, near the west end of the tunnel, as well as a large number of smaller and less valuable dwellings near the east end of the tunnel. Purchase was made of a considerable area bordering on the westerly harbor line of the Seekonk River, which land was subject to tide range. All of this real estate is in the city of Providence.

In East Providence considerable real estate was acquired north of Waterman Avenue and along Water Street quite a distance south of Waterman Avenue. This property was less expensive than that purchased in Providence.

*Land Easements.* — In addition to property acquired by purchase, an easement was taken by condemnation for the construction and maintenance of the tunnel under the surface, through the property on the tunnel line, between the westerly sides of Congdon and Gano streets. This easement gave the right to construct and maintain a tunnel within a width of 100 ft., with the vertical limits defined between the plane of mean high water "Providence base" for the lower limit, and distances varying from 46 to 61 ft. above mean high water for the upper limit. This upper limit varied from 5 to 8½ ft. below the actual surface of the ground.

The exact language of the taking in this particular as filed in court may be of interest.

#### ABSTRACT FROM PROVISIONS OF LOCATION FILED IN COURT TO COVER "EASEMENT TAKING."

"The vertical limit of the right and easement taken in the lands between the westerly side of Congdon Street and the west side of Gano Street is defined as follows: The upper vertical limit is defined by a series of planes, which through the entire width of said right and easement are defined by a line which shall pass under the streets named below at a maximum elevation above



mean high water, the city of Providence base of levels, not to exceed the following elevations:

At Congdon Street.....	61 ft.
At Prospect Street.....	61 ft.
At Brown Street.....	60 ft.
At Thayer Street.....	59 ft.
At Brook Street.....	59 ft.
At Hope Street.....	58 ft.
At Cooke Street.....	57 ft.
At Governor Street.....	56 ft.
At Ives Street.....	54 ft.
At Gano Street.....	46 ft.

"Between each two consecutive points named, the said upper planes shall not rise above a straight line joining the said two points, as delineated hereon and marked 'Diagram showing vertical limit for right and easement.' The lower vertical limit of said right and easement is a plane which coincides with mean high water, the city of Providence base of levels."

In other words, easement for the tunnel was taken under the various properties traversed by the line, which easement was a carefully defined volume of the earth definitely bounded on all four sides.

For several hundred feet from each portal to points where the minimum depth from the surface to top of tunnel was less than 30 ft., title in fee was acquired to avoid possible future complications that might arise from private ownerships.

The total cost of all real estate acquired in the city of Providence was the equivalent of one half of all construction costs of the work from the Union Station to the west harbor line of the Seekonk River.

*Arsenal Property.* — One of the most difficult, as well as interesting, real estate transactions was the acquisition of the arsenal property on the west side of Benefit Street, directly on the line of the tunnel. This had to be purchased and the old stone building moved to a new site.

It was found that the fee of the land and ownership of the building was in the state of Rhode Island, against which the right of condemnation of the property could probably not be maintained. It further developed that the greater part of the building was leased by the state to the Providence Marine Corps of Artillery, an organized military company, for a term of one thousand years from June 23, 1852, and at a yearly rental of

six and a quarter cents. As the state kept the building in repair, paid taxes — if any were assessed against the property — and was otherwise responsible as owner, it can readily be seen that the military company was much better off than it would have been if a new arsenal building were presented to it, with a deed of possession to both building and land. The outcome of the case was that valuable adjoining land, at the corner of Benefit and Meeting streets, was purchased by the railroad interest and deeded to the state of Rhode Island; the old stone arsenal building was moved to this new site, put in better condition than before, and the matter fixed up legally, so that the same relations exist between the state of Rhode Island and the military company. When this was accomplished the state deeded the old arsenal lot to the railroad.

Abstracts from the deed and lease of June 23, 1852, referred to, follow.

ABSTRACT OF DEED, PROVIDENCE MARINE CORPS OF ARTILLERY  
TO STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS.

"Providence Marine Corps of Artillery in consideration of \$600 . . . does hereby convey to the State of Rhode Island and Providence Plantations and its successors forever one certain lot of land with all the improvements thereon . . . June 23, 1852."

ABSTRACT FROM LEASE, STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS TO PROVIDENCE MARINE CORPS OF ARTILLERY.

" . . . State of Rhode Island and Providence Plantations for and in consideration of a certain conveyance of Real Estate made by said Providence Marine Corps of Artillery to said State of Rhode Island and Providence Plantations bearing even date herewith, does hereby demise and lease unto the said Providence Marine Corps of Artillery, their successors and assigns, the following described premises, to wit. — That portion of the State Arsenal, so called, situated in the City of Providence, which said Providence Marine Corps of Artillery now occupies, consisting of the Hall and entire room upon the street, to be held to the sole and exclusive use of said Providence Marine Corps of Artillery, their successors and assigns, the south tower of the said building to be held to the exclusive use of said Providence Marine Corps of Artillery, their successors and assigns, as a flag and storage room and for other purposes . . . (Some space reserved for Quarter Master General) . . .

"The said Providence Marine Corps of Artillery, their successors and assigns, also having the privilege of using and occupying the basement of said Building for the purpose of keeping therein their cannon, caisson, harnesses and other equipments with right of entry thereto for the purpose of taking them out and returning them, and also for the purpose of reaching and taking care of their furnace situated in the northeast corner of said Basement and for such other purposes as may be allowed by the Quarter Master General for the time being. . . .

"To have and to hold the said Premises with their appurtenances to them, the said Providence Marine Corps of Artillery, their successors and assigns, for and during the time of one thousand years from and after the date hereof, they paying therefor to said State of Rhode Island and Providence Plantations and its successors the yearly rental of six and a quarter cents.

"Dated June 23, 1852."

#### ALIGNMENT.

*General Route.* — A description of the new tunnel line and its approaches is as follows:

Starting at the easterly or northeasterly end of the Union Station, the line passes over the Woonasquatucket River and Promenade Street bridges, then over the freight yard and freight house on the west side of Canal Street, crossing Canal Street and North Main Street, with a clear head room of 16 ft. and 14 ft. respectively, to the east side of North Main Street, the alignment of the tracks going easterly, being very nearly a prolongation of the tangent at the station for a distance of about 1200 ft.; thence by an 8-degree curve to the right 600 ft., passing under Benefit Street and extending 400 ft. into the tunnel; thence easterly by a tangent 2720 ft. to the east portal of the tunnel at the east side of Canal Street; this tangent extends 250 ft. beyond the east portal on an embankment about 22 ft. above high water, made with material excavated from the tunnel; easterly from this tangent there is a 2½ degree curve to the right for 560 ft., still on the embankment, to the tangent extending over new Seekonk River roller-lift drawbridge. This tangent is 800 ft. long to a point about 20 ft. east of the channel span, where there is a double track junction on the bridge structure over the river; from this double track junction the south leg of a Y turns to the right for about 90 degrees, with a 7-degree curve, and joins the old tracks in East Providence leading to the south to India Point, Wilkesbarre Pier coal wharf, Warren, Bristol, Fall River and Newport; the north leg of the Y turns to the left for about

70 degrees, with a  $6\frac{1}{2}$ -degree curve and about 200 ft. south of Waterman Avenue, East Providence, joins the tracks leading northerly to East Junction; thence to Attleboro, Mansfield and Boston. Just at the north side of Waterman Avenue another double track junction is formed, with a new piece of double track line built across a pond to connect with the existing double track line from East Providence to Valley Falls, where it connects with the line from Providence to Worcester, and the line from Valley Falls to Franklin, Mass. This last line connects by two other routes to Boston.

*Tunnel Route.* — The tunnel alignment is a tangent, except for a short distance at the west portal, where the axis of the tunnel is for about 350 ft. on an 8-degree curve. The grade descends at the rate of 0.25 per cent. for about 100 ft. from the western portal and then rises at a grade of 0.101 per cent. for about 1,150 ft., beyond which it falls at a grade of 0.001 per cent. to the eastern portal. The cross-section is a three-center basket-handle arch with plumb walls, having a width of 30 ft. and center height of about 24.5 ft. above subgrade and 20 ft. 8 in. above the top of outside rail.

The tunnel passes diagonally under the streets of an area closely built up with handsome houses, so that the surface alignment encountered many obstructions and was made from a traverse line run wherever convenient, points and distances being established from which points on the axis of the tunnel were readily computed and plotted. Angles were read with a Bufl & Bufl triangulation transit graduated to 10 sec. Linear dimensions were measured with a 100-ft. steel tape with the usual spring balance tension adjustment and thermometer for temperature corrections. All angles and measurements were repeated several times, and the latter were made on the surface of the ground direct from point to point without the use of plumb bobs, regardless of the slope, which was afterwards determined by running a line of levels and computing the horizontal length of the line from the known parts of the triangles; the traverse thus made showing an error of closure of 1-50,000.

The profile of the surface of the ground rises sharply from El. 55 at Benefit Street to El. 140 at Prospect Street, in a distance of 1,000 ft., thence descends for 1,500 ft. to the Brook-street valley to El. 92, then rises for 1,100 ft. to a second summit at Cooke Street at El. 110, then falls to the portal at Gano Street



at El. 47. This contour made it possible to locate two towers on the western slope, one on the Prospect-street summit, one on the Cooky-street summit, and one on the eastern slope, on the roofs of houses so arranged that the tangents could be tested and corrected. Angles and distances were calculated from the traverse lines run on the cross streets, and points thrown on to the platforms: then from the computed angle at Gano Street the line was thrown to the tower between Ives and Governor streets and projected across the hill. This line struck  $\frac{3}{4}$  in. north of the point on Benefit Street fixed for the other initial point, and this variation was not exceeded at any intermediate point.

"Two points on the surface of the ground were located in the axis of the tunnel at the west end, and 5-in. artesian well holes were drilled vertically in the rock, permitting plumb bobs to be suspended in the tunnel to determine points in the tangent. At the east end of the tunnel, points 0.5 mile apart were permanently located in the extension of the axis tangent across the river, so that the line could easily be produced from the open cut through the portal.

"As the tunnel was driven, line and level marks were made on the floor plugs temporarily established in the heading, because the rock in the roof was so soft and unreliable that they could not be placed there. As fast as the headings advanced beyond each 100 ft. regular station, a well 2 ft. deep was blasted there in the floor of the heading and filled with concrete in which was set an 8 in. by 8 in. vertical wooden post, on which the marks were maintained until the concrete roof arch was completed, and the marks were transferred to plugs drilled in it. Permanent marks were finally established in the tunnel floor after those in the heading were destroyed by the removal of the bench. These precautions were efficient, and the accuracy of the work was so great that when the headings finally met, both lines and levels from the opposite portal corresponded within half an inch."\*

A peculiarity was noted in the action of alignment and level plugs set in the bottom of the heading, that may or may not correspond with observed action in other tunnels. It was noticed that many of the first alignment stakes that were set in a substantial batch of concrete deposited on the floor of the heading showed a movement of half an inch or more both sideways or

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\**Engineering Record*, November 7, 1908.

vertical. The most reasonable theory seemed to be that when a portion of the original hill was removed by the excavation of the pilot heading, an opportunity and space was thus given for the surrounding material to expand and move toward the free space, and that this was more likely to occur in rock of miscellaneous character, with no defined stratification, than in a more solid rock with regular stratification. The movement seemed to cease after the enlargement of pilot heading had been completed symmetrically on both sides.

#### WEST APPROACH VIADUCT CONSTRUCTION.

*Providence Viaduct.* — The viaduct forming the west approach to the tunnel from the Union Station to the west portal is about 1 200 ft. long, and passes over Woonasquatucket River, Promenade Street, Moshassuck River, a part of the yard and one of the freight houses on Canal Street, Canal and North Main streets. For 600 ft. of its length it was built of steel girders with solid, watertight floors consisting of reinforced concrete, carrying the ballast and tracks. The viaduct carries from 4 to 7 tracks, with liberal platform space contiguous to the station end. There are about 4 000 tons of steel in this structure, forming about 72 000 sq. ft. of bridging, of which 54 000 sq. ft. has reinforced concrete floors.

*Superstructure.* — The viaduct superstructure consists of steel columns supported by concrete bases resting on piles cut off below water level. Above the columns are generally transverse girders, some of box type and some of simple girder type. In a number of places longitudinal girders carrying the floor rest directly on the columns. The reinforced concrete floor is directly carried for a considerable area by 24-in. rolled beams, spanning two freight tracks below, beams spaced 18 in. apart and resting on transverse box girders, and for other portions by deeper plate girders with necessary cross supports between these plate girders. These deeper plate girders are carried by transverse simple girders, or rest directly on columns. Where headroom was most important, under the viaduct, the thickness of metal floor and reinforced concrete was made 2 ft. 3 in., and the total thickness from base of rail to underside of viaduct, not counting the transverse girders, was made 3 ft. 9 in. Where the viaduct crosses the freight yard, provision was made for spanning ten tracks. The extension of this bridging passes through freight house No. 4.

fronting on Canal Street, the floor of which was obstructed only by six steel columns; and good working headroom in the house is still left under the solid floor of the viaduct. At Canal Street the distance from base of rail to underside of girders crossing the street was made 7 ft. 4 in., which gave clear headroom of 16 ft. for Canal Street.

*Woonasquatucket River and Promenade Street Bridging.* — To meet the grade conditions of the new tunnel line, a portion of the bridging carrying the former tracks over these structures was raised by amounts varying from less than an inch to nearly 2 ft. This involved raising 18 trusses, each 106 ft. long, over the river, and 16 lines of box girders over Promenade Street, all carrying tracks laid on ballasted floor, with frequent passenger trains passing over them.

The structure built in the earlier work on the passenger station was well adapted for such raising, being practically separated at each 10 ft. in width into separate bridges, though so attached as to give ample side support to each other. The actual raising operations were so timed as to avoid lifting any locomotives or trains, although ample power was provided for such an emergency, and thin flat bars were inserted under each bearing as raised to avoid the risk of a drop should any one of the jacks fail. Sections of the bridge were raised a little at a time. It was found necessary to apply a lifting power sometimes as great as 600 tons under a section not over 20 ft. wide, this being for one end of a bridge about 106 ft. long.

The total area of bridging thus raised was about 34 000 sq. ft. About two thirds of this area was planked with 6-in. hard pine flooring laid continuously over both the trusses that were raised and those that were not. This heavy flooring therefore had to assume a warped shape to correspond to the new conditions.

A notable thing about this timber flooring is the uniformly excellent condition in which it was found. It was originally laid down in 1895, a good quality of hard pine timber not treated with any preservative process being used. Over it was laid several thicknesses of tar paper mopped together as for a gravel road. At a number of places openings were made, perhaps 2 in. in diameter, to let the water from the ballast floor drip through into the river below. In 1908 this timber flooring was examined at a number of places by digging down to it, and it was without

exception found wet and in as bright condition as when laid. Only at the extreme edges of the large area covered, where the timber could dry out and then become wet again, was there any rotten wood. It did not seem to be affected in this way for more than 2 or 3 ft. in from the exposed edge of the work.

The work of raising this bridging was successfully completed, without mishap, and was carried out by the S. W. Bowles Company, of New York.

*Moshassuck River Pier.* — Where the viaduct crosses the Moshassuck River, at a height of about 28 ft. above high water level, it became necessary to partially support the structure on an existing pier in the center of the river, which had a concrete footing and pile foundation about 7 ft. below low water level, designed to support only a light highway bridge.

The bearing area of this footing was not sufficient to sustain the 1 000 tons of additional load, and as the channel is already very narrow, it was inadmissible to obstruct it by a wide pier or by footings encroaching on the existing waterways. It was, therefore, determined to carry the steel column down to the foot of the pier shaft and there support it on a steel I-beam grillage, which occupies a comparatively small vertical height and distributes the load over a pile foundation about 20 ft. square at a level low enough not to interfere with the present waterway. The structure was accordingly designed as shown by the accompanying drawings: a sheet pile cofferdam was built around the end of the existing pier, a portion of the old masonry removed, the enclosure excavated to the required depth with an orange-peel bucket, and additional piles driven as required for the new foundation. The pile tops were cut off 16 ft. below high water level and enclosed in a mass of concrete deposited to a thickness of 3.5 ft. by bottom-dump buckets under water. After the concrete had set so as to seal the bottom of the cofferdam, the latter was pumped out dry and the grillage beams set and concreted, the steel column placed and enclosed in a cast-iron shell of the same cross-section as the pier, the space between the column and the shell concreted solid, and the pier masonry built up against the iron jacket, completing the work and giving it the final appearance of an ordinary steel column supported on the top of the pier, when in reality the column passes through the pier and is supported on a practically independent footing below it."\*

\* *Engineering Record*, December 12, 1908.



*Quantities.* — The construction of this viaduct required the following quantities of work and materials: 11 000 cu. yd. of excavation, 157 000 lin. ft. of foundation piles, 8 000 cu. yd. granite masonry, 5 700 cu. yd. Portland concrete masonry, 190 cu. yd. reinforced Portland concrete masonry, 7 800 000 lb. of structural steel, 91 000 lb. corrugated steel rods, 22 000 sq. ft. of Clinton wire cloth.

#### TUNNEL CONSTRUCTION.

*Character of Material.* — The preliminary indications were that the greater part of the excavation would be in solid rock, which it was hoped would prove sufficiently strong and sound to enable the tunnel to be constructed without timbering. It afterward developed that, although rock existed throughout the alignment, the stratification was very irregular and variable, which, with the peculiar quality and other conditions encountered, made the excavation difficult and dangerous and necessitated very careful timbering, heavy permanent lining, and the use of special methods of construction and precautions not originally anticipated.

The rock was chiefly a species of soft shale in strata from a small fraction of an inch to several feet thick, with thin seams of graphite material between them. Several geological faults were found in the vicinity of the tunnel, and the rock was folded and distorted into all shapes. In some cases a complete "S" was formed in 20 ft., bringing the strata alternately into horizontal and vertical planes and through all intermediate angles. The rock was found to be very treacherous and unreliable, and even when comparatively sound after excavation soon deteriorated, so that large masses might be pushed in by lateral pressure over the inclined seams lubricated by the graphite; or masses in the roof, which appeared to be solid, after a few days became loosened and fell if not supported. It was, therefore, necessary to provide heavy timbering as fast as the excavation was made and to replace it everywhere with a heavy concrete roof.

A good idea of the nature of the materials encountered was shown by the progress profile on which some of the descriptions marked from the east to the west portals were as follows: Very fine sand saturated with water; glacial till; grit and fine seamy conglomerate; fine grit and hard shale with some graphite, laminated; carboniferous shale, principally graphite; fine sand-

stone; increasing quantity of graphite; carboniferous shale, principally graphite near roof, wet and very heavy; talc, schist, rotten slate and quartz, very heavy; carboniferous shale and sandy schist, with some talc and considerable graphite, wet and heavy; water veins, slate, hard and comparatively dry; hard-pan and rotten stone; shale, talc and schist; veins of graphite in considerable quantities in fine sandy dry shale, liable to slip and requiring continuous timbering; sandstone; graphite, with large veins of quartz; fine sandstone, with thin seams of graphite; water-bearing carboniferous shale, with veins of graphite, laminated.

*Excavation.* — The tunnel was constructed entirely from the portals without the use of shafts, and excavation was commenced at both ends, with center top headings about 10 ft. wide and 10 ft. high. All of the material encountered, even including the hard-pan, was drilled by two pneumatic drills mounted on columns in each heading and blasted with 40 per cent. dynamite. The work was done with two 10-hr. shifts of about 18 men each. As usual, each shift concluded its work by firing the holes drilled and charged by it, and an interval of an hour was allowed to elapse for the fumes to be dissipated before the next shift commenced work mucking the displaced material, after which they drilled and blasted, making an average advance of about 160 ft. and a maximum of 217 ft. per heading per month. The muck was loaded into wooden 1-yd. end dump carts and run on 24-in. gage tracks, which were suspended from the roof for a distance of about 30 ft. beyond the face of the bench, to enable the material to be delivered directly to the steam shovel, which loaded it in the larger cars by which it was taken out of the tunnel.

The headings were enlarged for the full width of the tunnel, the excavation being made in two successive sections, leaving a bench nearly 18 ft. high in the center above the floor of the tunnel, which was not removed until after the permanent concrete roof had been built, releasing part of the timbering, providing an unobstructed working space, and affording complete safety for the workmen. At each side of the tunnel the rock was excavated about 2 ft. lower than in the center, carrying it down to a point only 3 ft. above the theoretical spring line of the arch, where the curve of the intrados was so small that the overhang beyond the side walls was negligible. Here the roof excavation was widened, as indicated in the diagram, considerably beyond the

original neat line for the arch, and an inclined skew-back surface was provided outside of the back of the side wall to afford support for the arch roof independent of the latter.

The removal of the bench followed the construction of the concrete roof arch at a distance of about 200 to 600 ft. As the clearance from the roof to the heading floor level was only about 7 ft., and the bench was 18 ft. high, the holes could not be drilled from top to bottom, and preliminary pits about 8 ft. deep were made 12 to 18 ft. apart transversely and 8 to 12 ft. back from the face of the bench. For these parts the holes were drilled inclined to nearly meet at the bottom, and when fired, blasted out a wedge-shaped portion of the rock, making a pit wide enough at the bottom for the drilling machine to be set up there and make two vertical holes about 4 ft. apart transversely and 10 ft. deep and 8 to 12 ft. back from the face of the bench. These holes were sprung twice with light charges to get the main charge down to bottom, and when the chamber thus formed had been blown out and loaded, it shattered about a 10 by 18 by 30 ft. prism of rock, which was generally reduced to pieces small enough to be handled by the steam shovel without further breaking.

Two shifts of 6 to 10 men each, with four drills, were kept constantly busy making the pits up to a distance of about 100 ft. beyond the face of the bench, and were followed by 4 to 6 men with two drills, working double shift, drilling the lower tier of holes and blasting off the bench. In this way each bench was taken out at an average speed of 250 lin. ft. per month, sometimes reaching a maximum of 270 ft., and all the excavation was accomplished with an average of a little less than 1 lb. of dynamite per cubic yard of muck measured in the cut. The broken rock was handled by a Marion steam shovel operated by compressed air and having a 1-yd. bucket, which delivered to 3-yd. end-and-side-dump wooden cars hauled by an electric locomotive on a 36-in. gage track. The cars were usually run in trains of four, and at both portals were delivered to a steam locomotive, which hauled them out to the dump and returned them empty to the electric motor.

*Disposal of Spoil.* — In order to provide for the filled approach to the Seekonk River bridge, it was specified that about two thirds of the tunnel excavation should be made from the east end. Accordingly operations were commenced there in May, 1906. A Marion steam shovel working in open cut delivered

the spoil to cars, which dumped it directly as required for the embankment. Rock was encountered in December, the open cut was finished in March, 1907, and the heading started from the east portal in April, 1907. The headings met April 6, 1908, at a point nearly midway between the portals. A large portion of the tunnel excavation was used for making fills, embankments and other railroad improvements.

At the west end the locomotive took the cars about 1 000 ft. beyond the portal to the crossing of the Moshassuck River, where the dump track was carried on a trestle about 30 ft. above water level. In the trestle was constructed a steel-lined wooden bin, about 50 ft. long, 20 ft. wide on top, and 20 ft. deep, provided with six horizontal steel gates on each side of the bottom, through which the muck was delivered at convenience to 30-yd. scows and towed 1.5 miles to make a 90 000-yd. fill at the Wilkes-Barre Pier, East Providence.

*Timbering.* — The character of the material encountered and the nature of the stratification necessitated temporary timbering for the greater part of the tunnel. At one place in the heading, just easterly of Brook Street, the rock was altogether lacking for about 180 ft.

As fast as the heading was extended the roof was supported by round oak crown bars, and the timbering was advanced as close as possible to the drillers. The two No. 1 crown bars, located 3 ft. on each side of the center line of tunnel, were set in final position and supported on slightly inclined posts, and sheeting planks were placed on them and the space above filled or wedged tightly against the rock.

In the hard-pan section near the middle of the tunnel, and at other points where the roof was not sufficiently self-supporting to allow even the narrow first heading to be driven without timbering, cross caps were set just above the grade of the No. 1 crown bars and supported on temporary posts, which were removed after a sufficient length of heading had been cleared to allow a 20-ft. crown bar to be placed under these caps and properly posted.

In the worst sections it was necessary to lag the roof tightly by driving poling boards ahead of the face of the excavation and follow the excavation immediately with lagging on the sides. In no case was it found necessary to keep the face of the heading lagged.



Two 10-hr. shifts of about 40 men each followed the heading gang with four drills and widened out the heading to the full width on both sides, at a distance of about 100 ft. in the rear. Timbermen set the remaining two pairs of crown bars, posts and roof boards, which completed the timbering and provided clearance underneath for the concrete arch.

*Concrete Mixing Plant.* — The tunnel was lined throughout with concrete generally made 1 : 3 : 5 with Alpha and Giant brands Portland cement and screened gravel, mixed in Ransom machines. These mixers were first located outside of the tunnel portals and delivered the concrete to 0.5 yd. 24-in. gage steel side-dump cars, from which it was dumped on each side of the track under the centering. After the work had advanced about 1 000 ft. from each portal, four traveling wooden towers, called "jumbos," were installed in each end of the tunnel, and each rear jumbo was equipped with a concrete plant, moving forward as the work progressed. Sand and gravel were brought in by the large cars which took out the muck, and were delivered to an elevator, which discharged them into the elevated measuring hopper serving the concrete machine.

As the concrete mixing and the roof arch building were carried on simultaneously on opposite sides of the bench where the steam shovel was at work, it would have been very difficult to transport concrete by any ordinary system of surface tracks. Great convenience and economy were effected by the method devised under which the concrete cars were suspended from a trolley hanger running on the lower flanges of an I-beam, which was hung by the top flange to the roof like the muck track beyond the bench, by connections permanently built into the concrete arch to provide for the future installation of electric trolley wires.

*Arch Roof Construction.* — The concrete arch roof was built before the bench was excavated. As soon as possible after the heading was widened to the full width, arch centers were set up 4 ft. apart on centers, covered with a 3-in. by 4-in. planed lagging, and the roof arch was built, usually in sections 8 ft. long.

The centers were made of four thicknesses of ordinary 2-in. by 12-in. chestnut plank, framed to neat joints, bolted together and spliced at the centers with interlocking jaw pieces thoroughly bolted. They were accurately wedged to position and sup-

ported by posts like those used for the crown bars, but were not connected at the bottom by horizontal transverse ties. The lagging strips, 4 ft. long, were dressed to accurate radial joints, and those at the ends of the arch only were nailed to the centers. The lagging was placed for a height of 3 ft. above the skew-backs at each side of the arch; concrete was shoveled up to the upper edge and rammed in to fill all of the space back to the rock surface; a few additional strips of lagging were placed; more concrete rammed in, and so on, with men working simultaneously on both sides of the arch until the concreting was completed nearly up to the crown, where the remainder was placed on transverse keying pieces and rammed longitudinally. Twenty sets of centering were provided at each end of the tunnel and were allowed to remain in position at least six days, after which they were taken down in the rear and set up again in front, the work being kept from 100 to 200 ft. behind the gangs that widened the headings.

The concrete in the arch roof averaged about  $3\frac{1}{2}$  cu. yd. per linear foot of tunnel and was built at a rate of about 200 ft. per month at each end of the tunnel by a gang of about 30 men working one shift.

The preliminary designs provided for a uniform thickness of 18 in. for the arched roof, but the rock was found to be so much worse than was anticipated, that this thickness was increased to a minimum of 24 in., extending in some places to 30 in. In order to provide temporary skew-back supports during the time when the rock was removed under the bearings of the arch, preparatory to constructing the side walls, the radial thickness of the arch ring was increased to about 4 ft. at the spring line, and the walls were built with a minimum thickness of 2 ft., which, of course, was considerably exceeded on account of the irregularities of the rock surface.

The roof consisted of a three-centered arch with intrados radii of 10 ft. and 23 ft. and a thickness generally varying from 24 in. at the crown to 4 ft. at the skew-backs. Under Gano Street and Benefit Street the arch ring was reinforced 2 in. from the inner and outer surface with both longitudinal and transverse rods, and the intrados line was changed.

*Side Wall Construction.* — The construction of the side walls followed the excavation of the bench at a distance of about 100 to 500 ft., and, except the curved portions, was commenced in

October, 1907, near the west portal and in January, 1907, at the east portal, and finished in August, 1908.

In the rear of each bench there were installed four wooden traveling towers or jumbos 30 ft. long, built of heavily braced connecting bents 4 ft. on centers of nearly the full height and width of the tunnel, which provided working platforms above the spring line from which the wall concrete was shoveled into molds formed by lagging attached to the sides of the travelers.

The travelers were wedged up under the roof arch to help support it while a section from 12 to 16 ft. long was undermined and strongly braced to make them rigid and provide clearance underneath the working platform for two tracks, on which concrete materials were delivered and muck was taken out from the steam shovel. Ordinarily, four of the travelers or jumbos were located at the forward end of the wall to carry the side forms, and the fourth "jumbo," with the concrete plant and elevating machinery already described, was maintained several hundred feet in the rear and delivered the concrete cars to the overhead suspended tracks, on which they were run to the forward jumbos, where their contents were dumped on the working platforms and then shoveled into the molds and rammed in place.

The rock was not excavated for the side walls until the last moment before the latter were built, when it was taken out in alternate sections, 10 to 18 ft. long, staggered on opposite sides of the jumbos, and separated far enough to avoid leaving more than 20 ft. of arch roof supported by the natural rock or new wall at one time. When the wall opposite each side of the forward jumbo had been completed, the jumbo was moved three panels or 90 ft. ahead, and the rock excavation and wall construction commenced there. As fast as the walls opposite the second and third jumbos were completed they were similarly moved forward and the work thus kept in constant progress at the rate of 150 to 200 lin. ft. per month. The forms were left in place at least three days after the concrete was laid, and the jumbos, mounted on double-flange wheels running on a single rail at each side of the tunnel, were easily moved forward by the electric locomotive.

In the hard-pan section it was found necessary to support the arch on posts on a timber floor which practically covered the heading level to within 3 ft. of the neat line of wall. The walls were then undermined by sinking pits to the rock, which had

previously been located by borings and found to be in no case below sub-grade. These pits were opened about 10 ft. long, and as soon as the forms could be set up the walls were concreted. Care was, of course, taken to keep these pits well scattered to prevent overloading the hard-pan, for while they were open the total weight of arch and earth cover of from 40 to 50 ft. had to be carried on the central core and the adjacent soil, which was already very heavily loaded, the arch acting as a bridge to span the opening. By taking small sections well separated the plan was entirely successful.

The side walls at Gano Street resisted a very heavy lateral thrust from the backfill and had vertical inner faces and battered rear surfaces, increasing the thickness from 7 ft. at the top, being the thickness of the spring of the reinforced arch, to 12 ft. at the bottom, where they were made integral with the footings, and the latter were made continuous with the thickened invert.

In each side wall there were sixteen glazed tile conduits for electric wires made accessible through 10 by 12 ft. splicing chambers, about 350 ft. apart. Refuge niches 4 ft. wide and 7 ft. high were built in the side walls 44 ft. apart under the conduits.

*Work at East Portal.* — About 460 ft. of the east end of the tunnel was constructed by "open cut and cover work." A bed of quicksand 15 ft. deep was encountered at Gano Street and extended about 8 ft. below sub-grade. At first this caused some difficulty, which was obviated by digging a trench 6 ft. deep on the center line, in which was laid an 8-in. drain of open-joint vitrified pipe, with lateral branches 6 in. in diameter, reaching to the side wall footings and draining them thoroughly in advance of the concrete construction, which had a footing of coarse sand filled in to a depth of 1 ft. above the side drain, a construction which was entirely successful and prevented any settlement.

The presence of this quicksand necessitated the construction of about 70 ft. of segmental invert 24 in. thick to provide for distribution of load and possible upward reaction. The backfill under Gano Street had a minimum depth of 4 ft.

*Contractor's Plant.* — The work was executed with a duplicate plant installed at the east and at the west end of the tunnel. The principal items of one of these installations included 1 Marion steam shovel, 2 horizontal 100 h. p. return tube boilers, 1 Rand air compressor, with receiver and pipe line; 15 Sullivan drills; 4 half yard dump cars; 15 narrow gage flat cars; 2 Gen-



eral Electric locomotives; 1 steam locomotive; 2 Ransome concrete mixers; 4 jumbo travelers, manufactured by the contractors; 1 electric windlass elevator used on the concrete machine; about 3 000 ft. of 24-in. gage track for the overhead concrete cars and for the muck cars in the headings; and about 4 000 ft. of narrow gage track on the tunnel floor level, with numerous turnouts and sidings.

*Progress.* — The item of progress per day and per month is always interesting on work of this character, and frequently of considerable importance financially to both the contractor and promoter of the project.

There were 4 430 lin. ft. of tunnel driven, the remaining portion, some at each end, being constructed by "open cut and cover work." The best six months' progress from the east end, from November, 1907, to April, 1908, was equal to 974 ft. of completed tunnel; this for 182 calendar days equals about 5.4 lin. ft. per day, and for 154 working days equals about 6.3 lin. ft. per day. The progress from the west end for the same period was equal to 1 230 lin. ft. of completed tunnel, being respectively 6.8 lin. ft. per calendar day and 8 ft. per full working day. The average total progress from both ends similarly reckoned was 14.3 and 12.1 lin. ft. The total progress from both ends for the 4 430 lin. ft. averaged 7.3 lin. ft. per calendar day and 8.4 lin. ft. per full working day.

*Overhead Contact.* — The tunnel line is electrically operated by direct current, transmitted by overhead contact at 650 volts, the No. 0000 trolley wire being suspended over the center of each track from pipe hangers built into the concrete arch roof.

*Lighting.* — The tunnel is lighted by electricity, 16 c. p. incandescent lamps being installed at intervals of 44 ft. The light brackets were connected to the conduit lines and projected from the inner face of the walls at a uniform height of 11 ft. above base of rail.

*Track Work.* — Tracks were laid 13 ft. center to center, New Haven road standard 100-lb. rail being used, laid on 8 ft. ties carried on rock ballast. This track work was done by the railroad under direction of J. M. Torr, division road master.

#### SEEKONK RIVER BRIDGE.

The bridge over Seekonk River carries a double track spaced 13 ft. center to center. It is a deck structure, with the excep-

tion of the Scherzer rolling lift bridge. The rolling lift span is 135 ft. center to center of piers, and as it crosses the channel on a skew gives a clear width between pile fenders of 90 ft. West of the channel span the tracks are supported by six deck plate girder spans, one of 37 ft., four of 74 ft., and one about 50 ft. East of the channel span there are five deck plate girder spans, one of 50 ft. and four about 60 ft. each. East of these spans the north and south legs of a Y are continued on two double track pile trestles, each about 450 ft. long, to the East Providence shore. The entire width of the river from the west harbor line to the east harbor line, measured on the center line of the bridge, is 1 150 ft. That portion of the bridge consisting of steel superstructure on granite piers is 800 ft. long.

*Substructure.* — The west abutment and the two westerly piers rest on piles cut off about 5 ft. below low water. Around the heads of the piles and for about 5 ft. thick on top of them Portland cement concrete was placed. The abutment and piers are of coursed granite masonry above the concrete, the backing being of Portland cement.

The remaining piers rest on piles driven and cut off to desired grade under water, and were built in open caissons, with bottoms 40 in. thick, consisting of four courses of timber. At six of these piers the piles were cut off 32 ft. below high water, requiring open caissons with sides about 32 ft. high.

*Quantities.* — The following quantities of work and materials were required on this bridge:

117 000 cu. yd. of dredging.
10 000 cu. yd. gravel fill.
20 500 cu. yd. riprap.
76 500 lin. ft. foundation piles.
14 200 lin. ft. fender piles.
66 700 lin. ft. piles in trestle.
417 000 ft. B. M. timber grillage.
462 000 ft. B. M. timber in trestle, etc.
232 800 lb. iron and steel in trestle, etc.
5 300 cu. yd. granite masonry.
2 300 cu. yd. concrete in core and backing.
340 cu. yd. concrete in counterweight of roller lift bridge.
3 473 000 lb. steel bridging.

#### EAST APPROACH CONSTRUCTION IN EAST PROVIDENCE.

A new double-track railroad, about one half a mile long, was constructed in East Providence, a part of the location being in a

cut through a sand hill, but the greater portion was on a 20-ft. fill through a pond north of Waterman Avenue. This new piece of track lies between the two former railroad lines from East Providence, one extending toward Valley Falls and Worcester, and the other to East Junction, Attleboro, Mansfield and Boston. About 100 000 cu. yd. of grading was required on this work.

*Waterman Avenue Bridge.* — This relocation of a portion of the lines at this point necessitated the construction of a new bridge to carry Waterman Avenue over the tracks. The bridge was built of reinforced Portland cement concrete, and varied in width from 53 ft. 6 in. to 61 ft. There were ten reinforced concrete girders 2 ft. 5 in. deep, between which and running transversely thereto the floor slabs were built 6 in. thick and reinforced with round steel bars, spaced 6 in. apart. The entire thickness of the roadway floor was 2 ft. 10 in., and the depth from the top of the sidewalk curbing to the under side of the bridge was 3 ft. 3 in.

An ornamental fence or balustrade of reinforced concrete 42 ft. long was built on each side of the roadway. The bridge carries two street railway tracks.

The cost of this structure, under contract prices, was about \$2.30 per sq. ft.

#### INTERLOCKING.

The interlocking and signal work required on the whole line was very extensive. In a length of 2.5 miles of roadbed there were installed two mechanical interlocking plants, with a total of 74 working levers, and a proportion of spare space, and two all-electrical interlocking plants, with a total of over 80 working levers.

One of the all-electrical plants was placed in the operators' house on the Seekonk River bridge at the west end of the draw span, and moved junction switches at the east end of draw and derail switches on shore at both ends of the bridge.

The other all-electrical plant was installed in a three-story concrete tower built at Promenade Street near the beginning of the new tunnel line at the Union Station, and had a capacity of 70 working levers.

All the interlocking plants referred to control 140 switches and movable point frogs and about 100 semaphore signals.

The material was furnished by the Union Switch and Signal

Company, and installed under the direction of C. H. Morrison, signal engineer of the New Haven road.

#### GENERAL DATA.

Franchise act passed April 13, 1904.

Work commenced April 19, 1906.

New double track line went into operation November 15, 1908.

Length of new double track line, 2.7 miles.

Tons of steel bridging, 6 000.

Area new bridge flooring, 2.75 acres.

Total length as single track of new bridging, 10 200 ft., or the equivalent of nearly one mile double track elevated railroad.

Span, center to center channel piers Seekonk River bridge roller-lift draw, 135 ft.

Moving weight roller lift draw, 1 550 tons.

Number piles on new line, 9 500.

Masonry on entire line, 70 000 cu. yd. (of this 43 000 cu. yd. of concrete is in the tunnel and portals).

Length of tunnel, portal to portal, 5 080 ft.

Cubic yards of excavation in tunnel, nearly 200 000.

Height of tunnel, 22 ft. 3 in. over top of rail.

Width of tunnel, 30 ft. for double track.

Greatest depth, surface to top of tunnel, 90 ft.

Variation of alignment when headings met,  $\frac{3}{8}$  in.

Headings met April 6, 1908.

Tunnel bore completed to sub-grade, September, 1908.

#### ENGINEERS.

The original tunnel layout was schemed by the writer prior to 1898, and the details later worked out and carried forward to successful completion under his immediate direction.

The project was presented by the writer in 1904 to Mr. F. S. Curtis, M. Am. Soc. C. E., then vice-president of the New York, New Haven & Hartford Railroad, and by him examined critically and endorsed.

Herbert L. Ripley, M. Am. Soc. C. E., was resident engineer during construction.

H. R. Wescott, assistant engineer.

The work was executed under the general supervision of the engineering department of the New Haven road: E. H.



McHenry, M. Am. Soc. C. E., vice-president; Edward Gagel, M. Am. Soc. C. E., chief engineer; William H. Moore, M. Am. Soc. C. E., engineer bridges.

#### CONTRACTORS.

The following were contractors on the more important parts of the work:

McCabe & Bihler Company, tunnel construction.

Holbrook, Cabot & Rollins, substructures Seekonk River bridge.

C. W. Blakeslee & Sons, substructures Providence viaduct; also reinforced concrete floors for bridges in Providence and East Providence.

S. W. Bowles & Co., erectors of steel work Providence viaduct, and the overhead bridges, supporting signals and electrical work.

Phoenix Bridge Company, superstructures for Seekonk River bridge, including Scherzer rolling lift.

Eastern Steel Company, steel for a part of Providence viaduct.

L. F. Shoemaker & Co., steel for a part of Providence viaduct.

Providence Steel and Iron Company, steel work for overhead bridges supporting electrical work and signals.

O'Connor & Andrews, abutments and walls, Waterman Avenue bridge.

Union Switch and Signal Company, interlocking material and signals.











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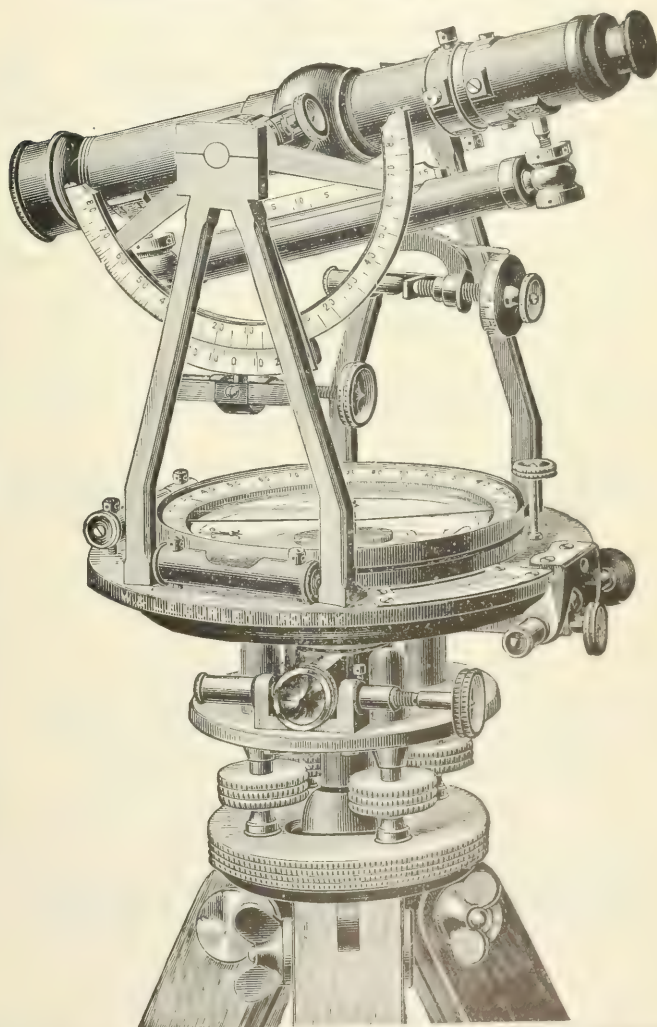
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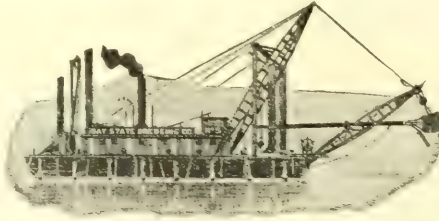
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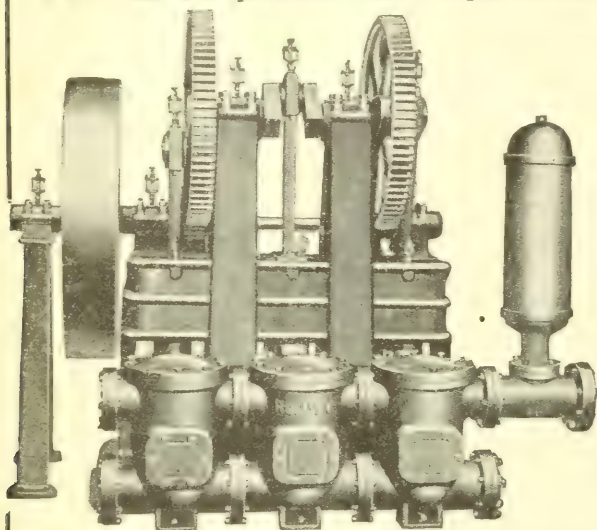
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ORGANIZED JULY 3, 1848.

## MONTHLY BULLETIN.

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NEW SERIES.

JUNE, 1909.

No. 33

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### REGULAR MEETING.

A regular meeting of the Boston Society of Civil Engineers will be held on Wednesday, June 16, 1909, at 7.45 p. m., in

CHIPMAN HALL, TREMONT TEMPLE, BOSTON.

Mr. Henry F. Bryant will read a paper entitled "A High Head, Hydro-Electric Development in Vermont."

**BUSINESS OF THE MEETING:** To ballot on the applications for membership as announced in this notice.

S. E. TINKHAM, *Secretary.*

---

### JUNE EXCURSION.

An Excursion is planned to the new reinforced concrete and steel Elevated Station at Forest Hills on the afternoon of Wednesday, June 16th next. By the courtesy of the Boston Elevated Railway Company a Special Train will be provided for the use of the BOSTON SOCIETY OF CIVIL ENGINEERS running over the new Forest Hills Extension of the Elevated, starting at Union-Friend Station at 2 p. m. and stopping at the various *south bound* stations (MILK, WINTER, BOYLSTON) in the Washington-Street Tunnel. *This train will be labelled Engineers' Special on the front car.* Members should be on hand at their nearest station in the Washington-Street Tunnel at 2 p. m.

A description of this work is given under news items elsewhere in this *Bulletin*.

The HUGH NAWN CONTRACTING Co. will entertain the party at the work.

The train will leave Forest Hills Station on the return trip after about an hour's inspection of the work.

Members may leave the Special Train at any of the stations on the Washington-Street Tunnel, but the main party will continue to the North Station Elevated where transfer will be made to shuttle trains for Battery Street. At this point the party will be directed by Mr. G. H. Brazer through the cold storage plant of the QUINCY MARKET COLD STORAGE AND WAREHOUSE Co., which consists of a new ten-story reinforced concrete building designed by J. R. Worcester & Co., Consulting Civil Engineers, a description of which is given under news items elsewhere in this *Bulletin*. Members who desire may join the party at this point about 3.30 to 4 P. M.

Members will please notify the Secretary of the Excursion Committee as to their intention of attending the Excursion not later than Tuesday A. M., June 15th.

**The Excursion will take place rain or shine.**

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## ANNUAL CONVENTION OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS.

As stated in the May *Bulletin* and in the special circular sent out last week, the Board of Direction of the American Society of Civil Engineers has extended a most cordial invitation to the members of the Boston Society of Civil Engineers to attend the annual convention of that Society to be held at the Mount Washington Hotel, Bretton Woods, N. H., July 6-9, 1909.

Members who expect to attend are urged to apply for hotel accommodations at once, and if parlor car seats are desired they should be secured at the earliest possible date. The indications are that there will be a very large attendance at the convention.

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## SUBSCRIPTION TO THE BUILDING FUND.

At the present time responses have been received from twenty-five members, and while the number of subscribers is not as large as the Committee anticipated, the average amount from each is very satisfactory. The Committee hope that those who have decided to subscribe will communicate at once the amount they propose contributing so that when the next *Bulletin* is issued the number of subscribers will be materially increased.

## CANDIDATES FOR MEMBERSHIP.

To be balloted on at meeting June 16, 1909.

### AS MEMBERS.

**ROBERT BAYARD BELLAMY**, Boston, (b. 1879). Graduated, B. S. degree, Trinity College, Hartford, 1901. In testing laboratory, Fore River Ship & Engine Co., Quincy, January, 1903, to August, 1903; transitman on railroad location in Central Pennsylvania, August, 1903, to February, 1904; with N. Y. & Long Island R.R. Co. on surveys and designs of 42nd Street subaqueous tunnel, May, 1904, to March 1905; on railroad location March, 1905, to August, 1905, in Central Pennsylvania; with N. Y. & L. I. R.R. on construction 42nd Street Tunnel, August, 1905, to August, 1906; assistant, Washington State Railroad Commission, August, 1906, to March, 1907; engineer at Kelley Mine, Kelley, New Mexico, April, 1907, to August, 1907; draftsman, El Paso & South Western R.R., August, 1907, to October, 1907; with International Boundary Survey, American Section, in charge of party on river topography along the Rio Grande, October, 1907, to March, 1908; traveling in Europe, April, 1908, to March, 1909. Recommended by R. A. Shailer, Fred Brooks, F. A. McInnes and L. L. Street.

**HAROLD L. CARTER**, Beaumont, Mass., (b. 1886). Graduate of the Mass. Institute of Technology class of '08, in mechanical engineering. Worked two summers during college course as traveling salesman, also two summers with H. P. Converse Company, Boston, structural steel and general contracting, and since graduation with the Inspection Department, Associated Factory Mutual Fire Insurance Companies, Boston, Mass. Recommended by Gaetano Lanza, E. F. Miller, W. E. Mott and Peter Schwamb.

**CLIFFORD NELSON COCHRANE**, Melrose, Mass., (b. 1884). Graduate of the Mass. Institute of Technology, class of 1908, in mechanical engineering. Worked two summers with Angus McDonald, Boston, contractor; one summer as assistant engineer with Morning Star Mining Company of Ophir, Colo., and since January, 1909, with Inspection Department Associated Factory Mutual Fire Insurance Companies, Boston. Recommended by Gaetano Lanza, E. F. Miller, W. E. Mott and Peter Schwamb.

**JOHN F. OSBORN**, Cambridge, (b. 1873). Graduate of Harvard University, 1896, with degree of A. B., taking at same time many courses in mathematics and engineering. First employed with Mass. State Highway Commission as draftsman; later went more into mechanical line with Planters Compress Co., Agnew-Auto Mailing Co., American Pneumatic and Lamson Consolidated Service Co.; and is at present with Charles T. Main in the design of industrial plants. Recommended by C. T. Main, F. M. Gunby, H. E. Sawtell and L. S. Cowles.

EDWARD HENRY ROCKWELL, Somerville, (b. 1869). Graduate of Worcester Polytechnic Institute, 1890, S. B. in civil engineering. From fall, 1890, to August, 1891, with G. S. Morrison, C. E., Chicago; August, 1891, to September, 1893, with E. M. Rockwell, woolen business, Leominster, Mass.; September, 1893, to February, 1895, sub-master, Leominster High School; February, 1895, to April, 1897, with Norcross Bros., draftsman and engineer; April, 1897, to April, 1899, Supt. Holliston Yarn Co.; April, 1899, to September, 1900, draftsman Boston Bridge Works; September, 1900, to September, 1901, first-class structural draftsman Department Yards and Docks, designing; September, 1901, to September, 1902, engineer and estimator with Boston Bridge Works; September, 1902, to September, 1903, instructor in civil engineering at Tufts College; September, 1903, to Sept. 1906, asst. professor at Tufts College; September, 1906, to present time, professor of structural engineering, Tufts College; June to September, 1906, with Boston Bridge Works; June to September, 1907, asst. engineer Boston Transit Commission; and September, 1907, to present, consulting engineer for steel construction, Suffolk County Court House. Recommended by H. A. Carson, J. I. Tucker, D. W. Stradling, J. C. Moses and J. P. Snow.

JOHN BENJAMIN RUSSELL, Boston, (b. 1869). Graduate of Dartmouth College, class of '93, C. S. D., also degree of M. S., 1896. Seasons of 1893 and 1894, with U. S. Coast and Geodetic Survey; 1895, with French & Bryant, topographical survey work; January, 1896, to May, 1897, with B. & A. R. R., lines and grades, designs, &c., abolition of grade crossings in Newton; May, 1897, to December, 1897, engineering inspector in charge at Fort McKinley, corps of engineers, U. S. A.; January, 1898, to June, 1900, (except February and March, 1899,) with James P. McDonald Co., New York, engineers and contractors, employed in various positions on the construction of the Washington Co. Railroad, and Richmond, Petersburg and Carolina R.R. of Va.; and on the latter from October, 1899 to June, 1900, as principal asst. engineer of construction; and since June, 1900, with B. & A. R. R.; at present, resident engineer on reconstruction of East Boston terminals. Recommended by W. G. S. Chamberlain, Wm. Parker, H. D. Woods and H. F. Bryant.

EZEKIEL C. SARGENT, Quincy, Mass., (b. 1874). Graduated from Adams Academy, Quincy, 1893, and attended Massachusetts Institute of Technology, civil engineering course, 1894-96. Since July, 1896, has been in the employ of the City of Quincy and is now City Engineer of Quincy, Mass. Recommended by E. W. Branch, F. E. Tupper, F. H. Carter and L. S. Cowles.

ROBERT LEE WHIPPLE, Adams, Mass., (b. 1881). Was graduated from the University of Vermont in 1906, (B. S. of C. E.). Instrument man and resident engineer, South and Western R. R.; June, 1906, to August, 1907, assistant to City Engineer, North Adams; and in private practice, August, 1907, to present time. Recommended by W. S. Johnson, F. S. Bailey, Charles Saville and X. H. Goodnough.

HARRY PERCIVAL WILSON, Medford, Mass., (b. 1882). Graduate of Tufts College in engineering, 1905; draftsman, Purdy & Henderson, May to July, 1905; Bridge shop, Eastern Bridge and Structural Co., August, 1905; Roebling Construction Co., draftsman, August, 1905-1906; asst. engineer, 1906-1907; in charge of designing steel and fire-proofing from 1907 to date. Is a Junior, American Society of Civil Engineers. Recommended by E. A. Norwood, C. A. Allen, J. I. Tucker, and F. T. Daniels.

## MINUTES OF MEETING.

### MAY MEETING OF THE SOCIETY.

BOSTON, MAY 19, 1909. A regular meeting of the Boston Society of Civil Engineers was held at Chipman Hall, Tremont Temple, at eight o'clock P.M. President George B. Francis in the chair. Eighty-two members and visitors present.

On motion, duly seconded, it was voted to dispense with the reading of the records of the last regular meeting and the special meeting of May 5th, inasmuch as they have been printed in full in the May *Bulletin*.

Messrs. Henry B. Alvord, Moses Burpee, John F. Callahan, Jr., Edwin P. Dawley, Ralph W. Emerson, Elmer O. Goodridge, Richard K. Hale, Arthur W. Hodges, Charles A. Mixer, Oren E. Parks and Frank C. Sargent were elected members of the Society, and Mr. James G. Lincoln was elected an associate.

The Secretary read a letter from the Secretary of the American Society of Civil Engineers extending on behalf of the Board of Direction of that Society a most cordial invitation to the members of the Boston Society of Civil Engineers to attend the Annual Convention to be held at Bretton Woods, N. H., July 6 to 9, 1909.

On motion of Mr. Brooks, the thanks of the Society were voted to the Directors of the American Society of Civil Engineers for their courteous invitation and the Secretary was directed to suitably acknowledge the same.

The following vote passed at the last regular meeting was ratified, as required by the By-laws, 35 voting in the affirmative and none in the negative:

VOTED: — That the Board of Government be authorized to use the permanent Fund for the purchase and equipment of a house for the Society.



The following amendment to By-law 10 offered in writing at the last meeting was adopted by a unanimous vote. Insert in the first paragraph before the word "year" in the sixth and eighth lines the word "fiscal" so that the paragraph shall read:

New members shall not be liable for the annual dues for the fiscal year in which they are elected, and, if elected after October 1, shall be liable for only one-half the annual dues for the ensuing fiscal year.

Mr. Edwin P. Dawley was then introduced and read an interesting paper entitled "The East Side Tunnel and its Approaches, Providence, R. I." The paper was fully illustrated by lantern slides.

The paper was discussed by the President and Mr. Sampson of the Society, and by Mr. H. L. Ripley, Assistant Engineer, and Mr. J. A. Droege, Division Superintendent of the N. Y., N. H. & H. R. R.

On motion of Mr. Sampson, the thanks of the Society were voted to Mr. Dawley for his courtesy in presenting to the Society so interesting a paper.

Adjourned.

S. E. TINKHAM, *Secretary*.

## LIBRARY NOTES.

### BOOK REVIEWS.

*The Steam Turbine.* By James Ambrose Moyer. 8 vo. ix + 370 pages, 225 figures. Cloth, \$4.00. Published by John Wiley & Sons, New York. 1908.

[Donated by the Author.]

This book is written for the use of men interested in turbine design. The earlier chapters are devoted to a brief discussion of the effects produced by heat and to an explanation of the temperature entropy diagram. The chapter on the design of nozzles treats the subject in a different manner from that usually employed; the areas required to discharge given weights being calculated by empirical formula based on tests.

An entropy heat chart of sufficient size to enable one to read values to three and some cases four figures is attached to the back cover of the book. Its use in nozzle design is explained fully. The subject of blade design is treated at considerable length. The mechanical losses in a turbine and the method of correcting

the results of tests so as to reduce same to a common vacuum or to a common boiler pressure or a common condition at entrance are fully discussed.

The different types of turbines including the marine and the low pressure turbine are illustrated and described.

The chapter on Steam Turbine Economics, one of the most valuable chapters in the book, contains information of great value to one considering the installation of a turbine plant.

The gas turbine is discussed in one of the later chapters.

Every engineer interested in turbine design or in turbine installation will find it well worth his while to read this work.

EDWARD F. MILLER.

#### RECENT ADDITIONS TO THE LIBRARY.

##### **U. S. Government Reports.**

War Department, Annual Report Chief of Engineers, 1908.

Coast and Geodetic Survey, Precise Leveling in United States.

Department Agriculture Temperature and Vapor Tensions in United States.

##### **State Reports.**

Connecticut, Annual Report Board of Health, 1907-08.

##### **City and Town Reports.**

Bangor, Me., Annual Report of Water Board, 1908.

Boston, Mass., Report on Docks. Desmond FitzGerald.

Brockton, Mass., Annual Report City Engineer and Sewerage Commission, 1908.

Medford, Mass., Annual Report City Engineer, 1908.

Milwaukee, Wis., Annual Report City Engineer, 1908.

Newton, Mass., Annual Report City Engineer, 1908.

New Bedford, Mass., Annual Report Supt. of Streets, 1908.

Northampton, Mass., Annual City Reports, 1908.

Providence, R. I., Annual Report City Engineer, 1908.

Springfield, Mass., Annual Report City Engineer, 1908.

" " " " Water Commissioners, 1908.

Woburn, Mass., Annual Report Water Department, 1908.

Worcester, Mass., Annual Report Water Commission and City Engineer, 1908.

Worcester, Mass., Annual Report Supt. of Sewers, 1908.

##### **Miscellaneous.**

New York, Catskill Aqueduct Contract Drawings.

\*Catalogue of Wheeler gift to Inst. A. I. E. E.; 2 volumes.

\*Star-Glow and Song, by Charles B. Going, C. E.

Natural Asphalt and Mineral Bitumen, by W. H. Delano.

FREDERIC I. WINSTON, *Librarian.*

## NEW ENGINEERING WORK.

(Under this head the Excursion Committee proposes to present each month a brief résumé of engineering work in progress in New England, as far as such information is readily obtainable. The assistance of members is desired, and items of interest will be gladly received. Such items are intended to include not only works of exceptional magnitude or containing novel features, but also engineering construction work of all kinds and all degrees of magnitude. Notes should be in the hands of the Committee not later than the 1st Wednesday of each month. The thanks of the Committee are due to the members who have furnished data for the Bulletin.—FRANK H. CARTER, Secretary, Excursion Committee, 2 Central Square, Cambridge, Mass.)

**Commonwealth of Massachusetts.**—**CHARLES RIVER BASIN COMMISSION.**—*Work in Progress at the Dam and Lock.*—Building harbor wall and placing earth and gravel filling for dam.

*Boston Embankment.*—Resurfacing the embankment between Cambridge Bridge and Berkeley Street, building roadway, walks, etc., laying brick gutters and setting edgestones.

**METROPOLITAN WATER AND SEWERAGE BOARD.**—*Water Works.*—Work is in progress in Beacon Street near Chestnut Hill Avenue and near Englewood Avenue, Brookline, on the new 48-inch main to reinforce the Boston Water Works low-service supply. It is expected that this pipe line will be entirely completed by July 1st.

Plans and contracts are being prepared for the laying of the 60-inch pipe line in Brighton and Newton; 24-inch and 16-inch pipe lines in Everett, Chelsea and Revere; and 12-inch pipe line in Arlington. Contracts have already been made for the pipes and special castings for these lines and the pipe-laying work will be begun as soon as the stock is received.

The work of enlarging the West Roxbury High-Service Pumping Station, which is located on Metropolitan Avenue near Washington Street, Roslindale, is in progress. An addition, 10 feet x 25 feet, is being made to the engine room to accommodate a small duplex pump, and an additional 60-inch vertical boiler is being installed.

**METROPOLITAN PARK COMMISSION.**—*Charles River Reservation.*—Grading, surfacing and other work for roadway in Charles River Reservation from Arsenal Street to North Beacon Street is in progress.

*Mystic River Reservation.*—Cradock Bridge tidal dam. Work of installing operating machinery for sluice gates and work of erecting lock gates is in progress.

Grading, surfacing and other work for drives along the Mystic River from High Street to Main Street is in progress.

*Winthrop Parkway.*—Work of completing to subgrade is in progress.

*Alewife Brook Purification.*—Contract has been made for excavating new channel for Alewife Brook and the work is about to be started.

**HARBOR AND LAND COMMISSIONERS.**—In Quincy Bay dredging is in progress, enlarging the channel at Wollaston Beach, which is to be 60 feet wide on the bottom and 3 feet deep at mean low water.

At East Bay, Osterville, work is about completed, dredging the entrance channel to a depth of 4 feet at mean low water, 100 feet wide outside the jetties and 150 feet wide inside.

At Sesuit Harbor, East Dennis, a stone jetty is being constructed about 600 feet in length. The core, which consists of small field stones, is about finished, and the large face stones are being placed.

At West Falmouth Harbor a small anchorage basin is being dredged to a depth of 6 feet at mean low water. A small hydraulic dredge is now working there.

In Plymouth Harbor a channel is being dredged to the wharf of the Plymouth Cordage Co. It is to be 18 feet deep at mean low water and 150 feet wide. Three dredges are at present employed on this work.

At Wellfleet an earthen dike is being built across the mouth of Herring River. This extends from hill to hill and is to be about 935 feet in length, 22 feet wide on top, at grade 17.7 feet above mean low water with side slopes on angles of 1 on  $1\frac{1}{2}$ . Sheet piling is used a core wall. Sluiceways, gates, etc., are built in connection with it.

*Massachusetts Highway Commission.*—Work is in progress in the following towns:—

Attleboro,	Foxboro,	Oxford,
Becket,	Ipswich,	Rowley,
Billerica,	Lee,	Russell (Surfacing).
Boston,	Milford,	
Erving,	Norton,	

\* **Boston, Mass.**—**QUINCY MARKET COLD STORAGE WAREHOUSE.**—This building is an extension of the Quincy Market Cold

Storage and Warehouse Company's buildings on Eastern Avenue, and completes the block out to Commercial Street. It is a building covering an area over fourteen thousand square feet, and is ten stories high above the street level. It is supposed to be as nearly fireproof as any building can be made at the present day, and also embodies the most up-to-date ideas with regard to insulation.

The building will be equipped with four large elevators each about eight feet square, running from basement to tenth floor. These elevators, together with three flights of stairs, are located in what is called the air lock. This air lock is separated from the rest of the building by an insulated partition composed of sealed cans five feet long by thirty inches wide and five inches thick filled with mineral wool. These cans are laid upon edge in Portland Cement Mortar and three-inch glazed tile laid up on both sides, making a partition practically twelve inches thick. This partition runs continuously from the second floor to the under side of the roof, passing through all the floors, and supported by them at each story. All doors leading from this air lock into the main portions of the building are large refrigerator doors set in galvanized iron frames.

The building is divided still further by a two-inch Portland Cement plastered partition and a concrete wall, making practically three equal sections. Wherever the fire wall is pierced by openings fire doors are provided.

All elevators and stair wells are separated from the air locks by still other insulated partitions with refrigerator doors, thereby forming a double seal to the rooms which are desired to be kept at a low temperature.

On the ceiling of each story there are located brine coils through which brine is forced continuously from the adjoining building. On the tenth floor are located large coils through which brine is forced and over which air is blown by large blowers, and this air after passing over and between these coils is carried down in shafts and distributed by means of dampers into the various stories below, thereby forming a double system of cooling.

The construction of this building has several interesting features, some being necessitated by the requirements for insulation and others for economy of space.

The foundations of this building are composed of reinforced concrete piers set on groups of piles. The basement floor was



constructed by turning arches from pier to pier. The outside walls of the building are of brick with terra cotta sign panels, and these walls are purely self-supporting. The first row of columns are placed one foot away from the inner face of the wall, and the floors are kept clear of the walls to allow the insulation to pass up without interruption, the only connection between the floors and walls being a small concrete tie, at each floor opposite every column, which was built into the brickwork.

Owing to the expense of keeping the building at a low temperature, the story height was kept down to about the height that goods could conveniently be piled, and for the same reason the flat slab construction was adopted, as it did away with the waste spaces in between beams which occur in other forms of construction. As the Company considered all floor area as very valuable, a great deal of study was devoted to the best method for constructing the columns in conjunction with the flat slab construction of the floor. It was estimated that a reinforced concrete column would require to be about 38 inches square in the first story, and this was considered to be altogether too large by the Company. Finally, a column composed of a structural steel core encased in concrete was designed, which was but 21 inches square. This column construction may be described as follows:—

The roof, tenth, ninth and eighth floors are supported on reinforced concrete columns which run down to within about a foot of the seventh floor, and are there carried on a structural steel core with an enlarged head which is the same size as the reinforced concrete column which it supports. This structural steel core is composed of four angles riveted together in a star shape. The seventh and sixth floors are carried on the concrete casing about this structural core, this casing being supported by another enlarged cap on the steel core which is above the fifth floor level, the steel core at this point taking all of the load above the fifth floor. The fifth and fourth floors are carried on the concrete casing about the steel core and in turn are supported on still another enlarged cap on the steel core, which is above the third floor line, the steel core at this point taking all of the load above the third floor. The third, second and first floors are carried on the concrete casing about the steel core, this casing resting on a cast iron pedestal which also supports the steel core, this pedestal in turn resting on the concrete foundation. This general con-

struction of the columns was carried out through the whole building. In order to figure the structural steel at the usual units it was necessary to devise some method to break the bond between the steel and the concrete, and to accomplish this purpose a sheet iron casing with slight indentations was made which was slipped around the steel core and wired in place. The small indentations held the sheet iron away from the steel sufficiently to prevent any great amount of shear being transferred by friction. One other precaution which was taken to insure the steel acting independently of the concrete casing was to omit the concrete casing directly under the enlarged head of the steel column until all of the floors had been constructed and the dead weight of the building was complete.

The floor slabs were supported by enlarged heads on the columns in all cases. The net work of reinforcement in the slabs was carefully held in position by wiring and the concrete was deposited about these rods with greater ease than was anticipated. Hangers were located on the centering and set in place before the concrete was deposited for the support of all pipe coils.

Another interesting point is the method which was employed to obtain a good bond between the granolithic finish and the concrete slab. As these floors were all laid in rather cold weather, it was deemed advisable not to attempt to run the finish at the same time the slab was run, therefore no finish was applied to the floors until the roof was on and the walls entirely completed and some heat had been turned into the building for the purpose of drying out. The concrete slabs were then gone over with a sand blast which, with the aid of a little picking and hammering here and there, removed all laitance and other inert material. This was satisfactory, so far as cleaning the floors and roughing the surface also to a certain extent, and after the sand blasting operation the floors were cleaned of sand and dust by blowing with the compressed air. After this was done the floors were well wet down and the granolithic finish applied.

The building was designed for the Quincy Market Cold Storage and Warehouse Company by J. R. Worcester & Company, Consulting Engineers of Boston, and constructed by Messrs. L. P. Soule & Son, General Contractors. W. F. Kearns Company were Sub-Contractors for the concrete work.

**\* Boston Elevated Railway Company.** ELEVATED AND SUBWAY CONSTRUCTION.—*Forest Hills Extension.*—The work now going on at Forest Hills Station and for a distance of about 400 feet north of the station building is novel and interesting from the standpoints of both design and construction.

The station is a through or side-track station, 360 feet long and 75 feet 3 inches wide, the loading or easterly elevated platform is 30 feet wide and 350 feet long, and has commodious waiting rooms and toilets, starters' room and duty room for trainmen, while on mezzanine story just over the surface platform is a trainmen's lobby.

The westerly or unloading platform is 19 feet 3 inches wide by 350 feet long, having a signal or interlocking tower at the northerly end.

Access to these platforms is gained by three flights of stairs, and to the easterly or loading platform an escalator of the Otis type is provided.

Surface platforms are provided directly under the elevated platforms.

The building resembles somewhat the mission style of architecture, and is of steel covered to the elevated platform level with concrete, and above this elevation are massive pilasters extending to the roof, and between them the usual copper work and a line of windows extending the entire length of the building.

At both ends of the station are pavilions, the northerly one being entirely roofed over. Between these pavilions and over the platforms are the usual type of canopies.

The concrete arches between the lower pilasters and at both ends of the station are hollow, the sides 4 inches and bottom 5 inches thick, and are supported on steel furring from the wall girders.

*Elevated Structure.*—Crossing the Arborway and for a distance of 376 feet north of the station the steel structure is incased in reinforced concrete.

The structure is designed to harmonize with the massive masonry of the N. Y., N. H. & H. R. R. over the Arborway, and is of single post construction, arched between posts.

The steel structure at each of the posts, with two exceptions,

consists of four 15-inch posts spaced 6 feet x 3 feet on centers, carrying two transverse girders 3 feet on centers, extending over the entire width of the structure. Above the posts the girders are each encased in concrete 3 inches thick, and the outline of the finished structure, 27 feet 4 inches wide over all, is of reinforced concrete 3 to 4 inches thick, the train floor being  $8\frac{1}{2}$  inches thick.

Provision has been made for expansion joints at every bent, and the drainage is down openings in the posts to the sewer.

Cable conduits are provided for under the footwalks, and the track is to be laid in ballast over the Arborway and on longitudinal stringers through the station.

The structure is being constructed under the direction of Mr. George A. Kimball, Chief Engineer, and was designed for architectural features by Mr. Edmund M. Wheelwright, and the steel work by Mr. Robert B. Davis, Designing Engineer, the actual construction being in charge of Mr. C. T. Fernald, First Assistant Engineer, and Mr. John Ware, Resident Engineer.

All the concrete work is being done by the Hugh Nawn Contracting Co.

**Manchester, Mass.**—The 1,000,000-gallon reinforced concrete reservoir at Manchester, Mass., which has been under construction for the past two months, is now being roofed in by the Guastavine Co., and will be ready to be filled July 1st.

Simpson Bros., the contractors, invite inspection from members of the Boston Society who are interested in this class of work.

**Concord, Mass.**—**WATER WORKS.**—Contract for extension of 16-inch supply pipe line from near Reformatory station to Nagog Pond in Acton has recently been let to the Henry Spinach Contracting Co. of Waterbury, Conn., and the contractor has just begun work. This contract involves about  $3\frac{1}{2}$  miles of laying 16-inch cast iron pipe, and a submerged intake extending about 1700 feet into the pond, but no other feature of importance. Metcalf and Eddy are the engineers.

**East Cambridge, Mass.**—Four-story building, Carter's Ink Co., being built by the Aberthaw Construction Co. reinforced concrete foundation, concrete columns, elaborate concrete front, first floor now being poured, using unit frames for reinforcement. Unusually efficient handling of concrete with dump cars and elevator. Work being pushed rapidly with a large gang of men.

**Dorchester, Mass.**— Foundation, first floor and engine room, Boston Insulated Wire & Cable Co., work being built by the Aberthaw Construction Co. Moderate sized job of pier foundation work carried on piles. Nothing unusual beyond well-handled reinforced concrete job. It is beside the New York, New Haven tracks, in sight of trains just beyond Savin Hill.

**New Bedford, Mass.**— The new Public Library is rapidly nearing completion. The classic walls of the former City Hall were retained, a stock room added and new floors built entirely of reinforced concrete.

Some interesting features are long span girders, concrete curved stairways and concrete curbs for rotunda.

The work was designed and installed according to the Kahn system and executed by their N. E. Agents, H. P. Converse & Co. of this city.

**Madison, Me.**— Hollingsworth & Whitney are pushing to completion the work on power development for their new pulp mill. The new concrete dam was completed last fall, and in a comparatively open winter remarkable progress has been made.

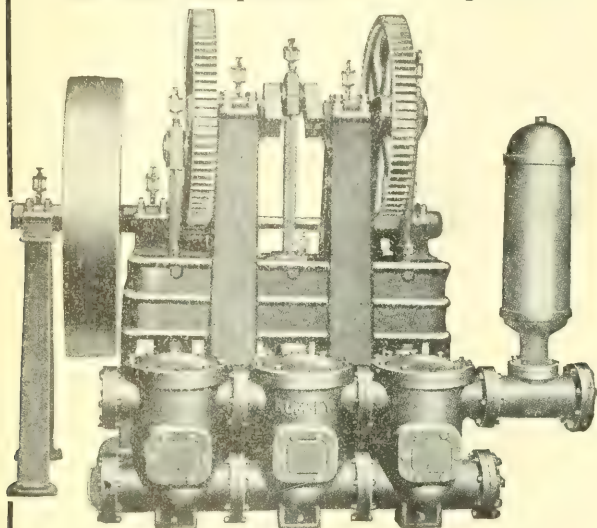
The structural steel, first deliveries of which were originally expected July 1st, is on the ground and erection progressing merrily. The Hollingsworth and Whitney Co. are doing the construction work, and H. P. Converse & Co. are furnishing and erecting the structural steel work according to the plans of H. S. Ferguson of Millinocket.

**New Haven, Conn.**— Winchester Repeating Arms Co. having two large factory buildings of flat mushroom reinforced concrete construction built by Aberthaw Construction Co., Boston. Each building is 300 feet long connected by corridor. Excavation is just starting. Interesting use of reinforced concrete for building where explosions must be guarded against. Work to be pushed rapidly with separate gangs on each building. Unusually efficient equipment will be put in operation on this work.



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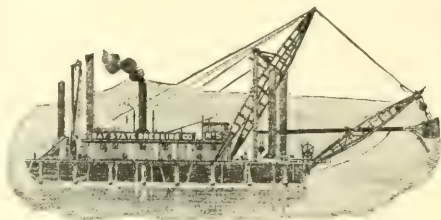
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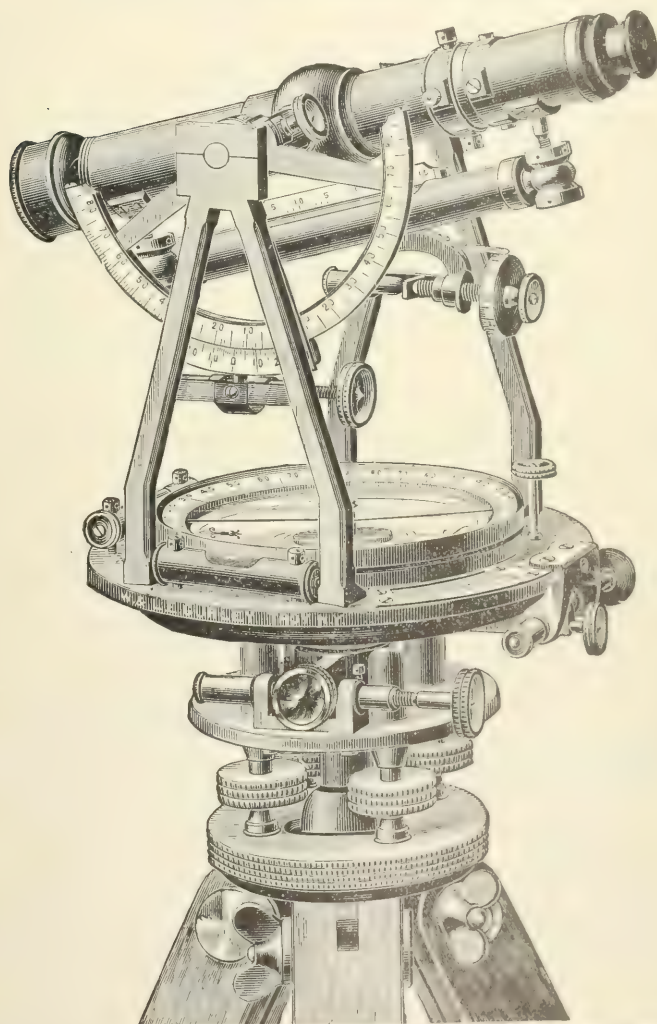
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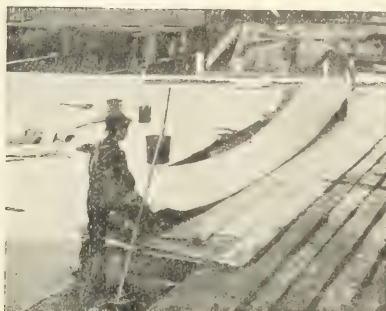
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**ORGANIZED JULY 3, 1848.**

## **MONTHLY BULLETIN.**

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NEW SERIES.

SEPTEMBER, 1909.

No. 34

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### **REGULAR MEETING.**

A regular meeting of the Boston Society of Civil Engineers will be held on Wednesday, September 15, 1909, at 7.45 p. m. in  
**CHIPMAN HALL, TREMONT TEMPLE, BOSTON.**

Mr. James W. Rollins, Jr., will read a paper entitled "Building the Shut-off Dam at the Charles River Basin." The paper will be illustrated by lantern slides.

**S. E. TINKHAM, *Secretary.***

### **EXCURSION.**

There will be an excursion on Wednesday afternoon, Sept. 15, 1909, to the new deep water terminal of the Boston and Albany Railroad, at East Boston, Mass., which consists briefly of two (2) new piers and sheds 240 feet wide by 780 feet long, with the necessary second story developments to accommodate Trans-Atlantic passenger traffic, dredging and developing of slips 200 and 250 feet in width; the construction of a temporary grain transfer and grain gallery system for distribution of grain into vessels; the construction of a permanent fireproof one million (1,000,000) bushel grain elevator; a one hundred thousand (100,000) gallon tank 200 feet high for emergency fire purposes, together with necessary piping, intakes, etc.; the entire rearrangement of the yard layout; the removal and reconstruction of engine house, freight house and team delivery yard, etc. Involving the necessity of a great many kinds of different work, including pile driving, heavy timber work, difficult excavations, steel work, fireproofing, etc.

Members who will attend this excursion are requested to be in the general waiting room of the Revere Beach and Lynn R. R. Station at Rowes Wharf in time to be taken across on the boat which is due to leave Rowes Wharf at 2 p.m.

**EXCURSION COMMITTEE.**

## OCTOBER AND NOVEMBER MEETINGS.

The following preliminary announcement is made of papers to be read at the October and November meetings of the Society:

OCTOBER 20, 1909. — A joint meeting with the Boston Section of the American Society of Mechanical Engineers at which a paper will be presented prepared by Messrs. Gaetano Lanza and Lawrence S. Smith entitled "Comparison of the Results Obtained by the Use of Three Theories of the Distribution of the Stresses in Reinforced Concrete Beams with the Experimental Results."

NOVEMBER 17, 1909. — "Waterproofing of Engineering Structures," by Joseph H. O'Brien.

"The Use of Manard Steel in Railroad Track," by Mr. Vickery of the Pennsylvania Steel Co.

## SANITARY SECTION MEETING.

The next meeting of the Sanitary Section of the Boston Society of Civil Engineers will be held at the Boston City Club on Wednesday, Oct. 6, 1909. Mr. Alexis H. French, Town Engineer of Brookline, will read a paper entitled "Public Comfort Stations." Mr. Arthur D. Marble, City Engineer of Lawrence, will describe the new public comfort station in that city, and the J. L. Mott Iron Works and possibly other manufacturers will exhibit by lantern slides and otherwise the latest type of plumbing fixtures used in such stations. Notice will be sent later of an excursion to Brookline on the afternoon of the meeting to inspect the new work in that town. It is hoped that the members will take advantage of this very good opportunity to become informed about a subject of growing importance.

## MINUTES OF MEETING.

### JUNE MEETING OF THE SOCIETY.

BOSTON, JUNE 16, 1909. — A regular meeting of the Boston Society of Civil Engineers was held at Chipman Hall, Tremont Temple, at 8 o'clock P.M., President George B. Francis in the chair; forty-five members and visitors present.

The record of the last meeting was read and approved.



Messrs. Robert B. Bellamy, Harold L. Carter, Clifford N. Cochrane, John F. Osborn, Edward H. Rockwell, John B. Russell, Ezekiel C. Sargent, Robert L. Whipple and Harry P. Wilson were elected members of the Society.

Messrs. Otis F. Clapp and Edwin F. Dwelley, the committee appointed to prepare a memoir of Isaac K. Harris, submitted its report, which was read by the Secretary.

On motion of Mr. Barrows, chairman of the Excursion Committee, it was voted unanimously: That the Society express its hearty thanks to the officials of the Springfield Water Department for the privilege recently enjoyed of visiting the new works of the Little River supply, and for the hospitality and kind attention shown on this occasion.

On motion of Mr. Howard it was voted unanimously: That the thanks of the Society be expressed to the officials of the Boston Elevated Railway Company and to the Hugh Nawn Contracting Company for courtesies extended today in visiting the new Forest Hills Station; also to the Quincy Market Cold Storage and Warehouse Company for the privilege of inspecting their new cold storage building.

Mr. Henry F. Bryant then read the paper of the evening, entitled, "A High Head Hydro-Electric Development in Vermont." The paper was very fully illustrated by lantern slides. It was discussed by Messrs. Charles T. Main and Harold K. Barrows.

Adjourned.

S. E. TINKHAM, *Secretary*.

## APPLICATIONS FOR MEMBERSHIP.

The following applications for membership have been received and are now before the Board of Government for approval. Members having information which will assist the government in its consideration of these applications are requested to communicate at once with any member of the Board. Communications will be regarded as confidential and for the use of the Board alone.

### AS MEMBERS.

THEODORE MERRITT BEACH, Springfield, Mass. (b. 1882). Received his education in the New York State Normal School, leaving in the fall of 1900. Began engineering work in the spring of 1901 as rodman for the B. & O. R. R. Co.; from spring of 1902 to summer of 1903 transitman for Penn. R. R. Co.; summer of 1903 to summer of 1906 assistant engineer for the City of New Castle, Pa.; summer of 1906 to date has had charge

of surveying party for City of Springfield, Little River Water Supply. Recommended by T. W. Norcross, E. E. Lochridge, C. R. Gow and D. M. Wood.

WILLIAM H. ELLIS, JR., Boston (b. 1884). Attended public schools of Boston, including the Mechanic Arts High School. Began work with W. H. Ellis, general contractor in 1902, as timekeeper and assistant in estimating; in 1904 with B. & M. R. R. as rodman and after 8 months was made transitman, which position he held for two and a half years; at present estimating and superintending on outside work for W. H. Ellis & Son. Recommended by J. N. Ferguson, F. P. Spalding, A. E. Tarbell and M. T. Cook.

WILLIAM FREDERICK FARLEY, Waltham, Mass. (b. 1883). Graduate in civil engineering, Massachusetts Institute of Technology, 1906. From June, 1906, to September, 1907, with Ambursen Hydraulic Construction Co.; September, 1907, to February, 1908, assistant engineer with New York State Water Supply Commission; February, 1908, to February, 1909, with New York State engineer and surveyor as assistant engineer on highway construction; and at present with Boston Elevated Railway Co., office of chief engineer, elevated lines. Recommended by H. L. Coburn, C. T. Fernald, E. M. Moses and L. S. Cowles.

OREN LESLIE GOODRIDGE, Houlton, Me. (b. 1882). Received B. S. and C. E. degree from University of Maine, June, 1903. From June, 1903, to April, 1906, rodman and instrument man, Bangor & Aroostook R.R.; April, 1906, to September, 1906, leveler on location Great Northern Railway; September, 1906, to March, 1907, instrument man M. of W. Department, Chicago & Northwestern R. R., and March, 1907, to present assistant engineer M. of W., Bangor & Aroostook. Recommended by H. S. Boardman, H. S. Ferguson, J. W. Tower and Moses Burpee.

EDWARD RUDDOCK HYDE, Somerville, Mass. (b. 1883). Graduate of Massachusetts Institute of Technology, 1906, and since that date with the civil engineering department of the Fore River Shipbuilding Co. Recommended by C. W. Sherman, Leonard Metcalf, W. T. Barnes and J. F. Wilber.

DANIEL PATRICK KELLEY, Boston (b. 1884). Graduated from Mechanic Arts High School in 1901, post-graduate course in 1902, and at Massachusetts Institute of Technology 1902-1904. From June to December, 1904, with H. H. Carter of the Metropolitan Contracting Co. on construction of concrete conduit, Back Bay Fens, the widening of Atlantic Avenue, construction of Boston & Maine Docks; during the next year was engineer for John A. Costello, contractor, on sewer and street construction; from February to October, 1906, with Mark H. Lynch, general contractor, and since October, 1906, with Charles River Basin Commission on construction work of the dam and lock. Recommended by J. A. Holmes, J. N. Ferguson, H. M. McCue and R. W. Emerson.

JOHN LEROY MANN, Monte Cristi, Dominican Republic, W. I. (b. 1872). A. B., Dartmouth College, 1894; C. E., Thayer School of Civil Engineering, 1898; Albany Filtration Plant, 1898-1899; instructor, associate pro-

fessor, Thayer School Civil Engineering, 1899-1904; U. S. Reclamation Service, 1904-1907; Ingeniero Director Servicio Irrigacion en Monte Cristi, Dom. Republic to date. Recommended by W. H. Balch, M. F. Brown, J. G. Andrews and J. P. Snow.

STANLEY A. MILLER, Aqua, Dominican Republic, W. I. (b. 1882). Student in engineering courses, Louisiana State University, 1897-1900; Associate member American Society Civil Engineers and member N. E. Waterworks Association; 1900-1901, rodman, instrument man and inspector on railroad and sewerage work in Louisiana; 1901-1902, assistant engineer Mobile, Ala., on sewerage and asphalt pavements; 1902, instrument man on railroad location in Alabama and Florida; 1903, assistant engineer to Charles B. Davis, constructing engineer New York, investigating and designing waterworks and sewerage for Dallas, Tex., and South Macalester, Okla., and irrigation at Victoria, Tex.; 1904-1906, resident engineer in charge, on railroad terminals and hydro-electric work in Mexico; 1906-1908, resident engineer trunk line sewers at Cairo, Ill., and Paducah, Ky., and on two high dams in California and Colorado for hydro-electric developments; and February, 1909, to date, engineer in charge of hydraulic studies, preliminary to construction of irrigation schemes (one million dollars involved) under general direction of H. F. D. Burke, late division engineer, Pann T. and T. Co. Recommended by W. H. Balch, A. B. MacMillan, W. M. Bailey and C. J. Hogue.

CHARLES WELLMAN ROBINSON, Winthrop, Mass. (b. 1878). Finished public school education at Medway High School, private tuition in architectural work, 1904 and 1905; Y. M. C. A. course and private tuition in mathematics and theory of structures, 1906 and 1907; August, 1905, to September, 1906, draftsman, granite work, at Norcross Plant, Milford, Mass.; September, 1906, to February, 1907, structural draftsman, Builders' Iron & Steel Co., East Cambridge; February, 1907, to August, 1909, structural draftsman, Boston Elevated Railway Co., and now with Boston Bridge Works. Recommended by J. C. Moses, E. R. Olin, A. F. Brown and L. S. Cowles.

CONANT W. RUTH, Wakefield, Mass. (b. 1884). Educated at Rickes Academy and at Tufts College. From spring to fall, 1906, transitman with Bangor and Aroostook R.R., and from fall of 1906 to 1907 with Boston & Albany R.R.; spring of 1907 to spring of 1908 with Stone & Webster Engineering Corporation, and at present with Orcutt Signal Co. as engineer. Recommended by H. P. Wilson, J. I. Tucker, W. C. Whitney and W. G. S. Chamberlain.

HARRY FRANCIS SAWTELLE, Cambridge, Mass. (b. 1875). Graduate Massachusetts Institute of Technology, 1898. From 1898 to 1903 draftsman; 1903 to 1906 assistant engineer Cambridge Commission; 1906 to July, 1907, engineering department, Am. Tel. & Tel. Co.; July, 1907, to April, 1909, inspection department, Asso. Factory Mutual Fire Ins. Cos.; and April, 1909, to date engineer's office, Cambridge, Main St. Subway, Boston Elevated Railway Co. Recommended by F. H. Fay, S. E. Tinkham, G. A. Kimball and L. S. Cowles.

CHARLES EDWARD FRANKLIN STETSON, Houlton, Me. (b. 1850). From 1874 to 1877 student, chairman, rodman and instrument man in office of Col. J. Albert Mason, Providence, R. I.; 1881-1885 assistant engineer, N. Y. W. S. & B. R. R.; 1887-1888 engineer in charge of surveys and construction, Houlton, Me. sewers; 1889-1890 County Commissioner of Aroostook County, Me., and from 1891 to present time assistant engineer, locating engineer, construction engineer and principal assistant engineer Bangor and Aroostook R.R. Recommended by H. S. Ferguson, J. W. Tower, E. L. Corthell and Moses Burpee.

## LIST OF MEMBERS.

### ADDITIONS.

JOHN F. CALLAHAN, JR.	117 High St., Charlestown, Mass.
HAROLD L. CARTER	165 Bellingham Ave., Beachmont, Mass.
JOHN B. RUSSELL	372 South Station, Boston.
WILLARD C. TANNATT, JR.	Town Engr., Easthampton, Mass.

### CHANGES OF ADDRESS.

E. M. BLAKE	301 Overland Bldg., Boise, Idaho.
W. L. BUTCHER	Cambridge, Mass.
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C. R. ELKINS	10 Myrtle Terrace, Springfield, Mass.
R. W. EMERSON	132 Hite Ave., Crescent Hill, Louisville, Ky.
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W. M. FOSTER	Aguacale Mines, San Jose, Costa Rica.
E. M. FRENCH	75 Pierrepont St., Brooklyn, N. Y.
W. B. FULLER	150 Nassau St., New York, N. Y.
H. J. GLENDENNING	State Highway Comm., Augusta, Me.
B. W. GUPPY	Bridge Engineer, B. & M. R. R., Boston.
G. E. HOWE	1 Ashburton Pl., Boston.
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C. F. MORSE	Wallkill, N. Y.
W. E. MOTT	Carnegie Technical Schools, Pittsburg, Pa.
F. L. MURRAY	244 Brighton St., Belmont, Mass.
W. H. NORRIS	238 St. John St., Portland, Me.
F. B. SANBORN	Cambridge B, Mass.
J. M. Siner	156 Hawthorn St., Malden, Mass.
C. M. SPOFFORD	Massachusetts Institute of Technology.
H. A. STORRS	626 Citizens National Bank Bldg., Los Angeles, Cal.
E. A. TAYLOR	Alder, Wash.
D. M. WOOD	12 Greenleaf St, Malden, Mass.

### DEATH.

EDWIN W. ELLIS	Died Aug. 3, 1909.
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## LIBRARY NOTES.

### RECENT ADDITIONS TO THE LIBRARY.

#### United States Government Reports.

- Dictionary of Altitudes in United States.
- Figure of the Earth and Isostasy.

#### State Reports.

- Massachusetts, Annual Report Metropolitan Water and Sewerage Board, 1908.
- Annual Report State Highway Commission, 1908.
- Metropolitan Improvement Association Report, 1908.
- Rhode Island, Annual Report of Commissioners of Dams and Reservoirs, 1908.

#### City and Town Reports.

- Albany, N. Y., Annual Report of Bureau of Water, 1908.
- Baltimore, Md., Annual Report of Water Engineer, 1908.
- Boston Finance Commission Reports; three volumes bound in two.
- Chicago, Ill., Annual Report of Department of Public Works, 1908.
- Cincinnati, O., Report of Chief Engineer (Water Works), 1897-1909.
- Erie, Pa., Annual Report of Water Works Commissioners, 1908.
- Hartford, Conn., Annual Report of Water Department, 1908.
- Haverhill, Mass., Annual Report of City Engineer, 1908.
- Holyoke, Mass., Annual Report of City Engineer, 1908.
- Lowell, Mass., Annual Report of Water Board, 1908.
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**Miscellaneous.**

American Water Works Association, 1908.

Blackwells Island Bridge. F. C. King.

Street Railways in England and Prussia.

Bridge Design and Maintenance. H. C. Keith.

Engineering Work in Towns and Cities. Ernest McCullough.

Azimuth. Geo. L. Hosmer.

Submarine Blasting in Boston Harbor. J. G. Foster.

Mitering Lock Gates. H. F. Hodges.

Bricklaying System. Frank B. Gilbreth.

Modern Methods of Street Cleaning. George A. Soper.

The Metric Fallacy. Halsay and Dale.

## NEW ENGINEERING WORK.

(Under this head the Excursion Committee proposes to present each month a brief résumé of engineering work in progress in New England, as far as such information is readily obtainable. The assistance of members is desired, and items of interest will be gladly received. Such items are intended to include not only works of exceptional magnitude or containing novel features, but also engineering construction work of all kinds and all degrees of magnitude. Notes should be in the hands of the Committee not later than the 1st Wednesday of each month. The thanks of the Committee are due to the members who have furnished data for the Bulletin.—FRANK H. CARTER, Secretary, Excursion Committee, 2 Central Square, Cambridge, Mass.)

**Commonwealth of Massachusetts.**—**CHARLES RIVER BASIN COMMISSION.**—*Work in Progress at the Dam and Lock.* The harbor and basin walls are practically completed, with the exception of the coping, and the filling for the roadway will probably be finished by the middle of the month.

*Boston Embankment.*—The fence is being erected on the new basin wall, beginning at the Cambridge Bridge and working up stream. A macadam roadway from Charles Street to Otter Street is nearly completed. The binder for the top layer of macadam is composed of 90 per cent. Tarvia-X and 10 per cent. asphalt. The loam on the embankment is being graded, and it is expected that spreading fertilizer and sodding will be in progress during the month. The granolithic walk next the basin wall will soon be completed from the Cambridge Bridge to Harvard Bridge.

*Dredging in Basin.*—At Watertown dredging has been started for a channel 50 feet in width with 5 feet depth of water below the Galen Street Bridge, and a channel giving 3 feet of water above Galen Street Bridge is also in process of construction.

**METROPOLITAN WATER AND SEWERAGE BOARD.**—*Water Works.*—Work is in progress on 60-inch supply pipe line in Commonwealth Avenue near Foster Street in Brighton, to reinforce the existing 48-inch main; on a 24-inch northern high-service pipe line in Fenno Street, Revere, near the Chelsea boundary line, to reinforce the existing 20-inch pipe line, and on a 12-inch northern extra high service pipe line in Park Avenue, Arlington Heights, for supplying a small area of high land in Belmont. Work is being completed on a 16-inch northern high service pipe line in Winthrop Avenue in Revere, to be used in place of the existing 12-inch Revere pipe line for supplying water to Winthrop.

**METROPOLITAN PARK COMMISSION.**—*Alawic Brook Purification.*—Work of excavating new channel for Alawic Brook is in progress.

Work of construction of concrete retaining walls between Broadway and Massachusetts Avenue is in progress.

*Charles River Reservation.*—Grading, surfacing and other work for roadway in Charles River Reservation from Arsenal Street to North Beacon Street is in progress.

*Mystic River Reservation.*—Grading, surfacing and other work for drives along Mystic River from High Street to Main Street is in progress. Work of dredging for deepening and widening of channel of Mystic River is in progress.

MASSACHUSETTS HIGHWAY COMMISSION.—Work is in progress in the following towns:—

#### CONSTRUCTION.

Agawam,	Haverhill,	South Hadley,
Becket,	Huntington,	Southampton,
Charlton,	Lee,	Sterling,
Chester,	Marshfield,	Stockbridge,
Clarksburg,	Oxford,	Sturbridge,
Deerfield,	Phillipston,	Templeton,
Duxbury,	Rowley,	Tyngsboro,
Eastham,	Salem,	West Newbury.
Hamilton,	Scituate,	

#### SURFACING.

Auburn,	Nantucket,	Spencer,
Bourne,	Newburyport,	Walpole,
Concord,	Norwood,	West Newbury,
Dartmouth,	Norfolk,	Weston,
Holden,	Paxton,	West Springfield,
Lee,	Quincy,	Whately,
Lincoln,	Randolph,	Worcester.
Marion,		

HARBOR AND LAND COMMISSIONERS.—Work is now in progress as follows:

Dredging channel and anchorage basin at West Falmouth.

Dredging channel at Rock Creek, Orleans, Mass.

Building dike at Herring River, Wellfleet. Contractors are about ready to make the closure.

Building riprap of granite quarry grout to protect shore which is washing away at Chatham, Mass.

Strengthening with stone riprap the jetties at the mouth of Bass River at South Yarmouth.

Protecting with stone riprap the westerly bank of the Connecticut River at the Holyoke Canoe Club at Smith's Ferry.

Building an extension to the stone breakwater at Vineyard Haven on Martha's Vineyard.

Dredging a channel at Orient Heights up to the landing of the Orient Heights Yacht Club.

Bids have just been received and contracts will probably be awarded next week for building about 280 feet of concrete sea wall on the beach at North Scituate, and for dredging shoals in the channel of Annisquam River and a new channel into Lobster Cove, a branch of Annisquam River.

Plans are being prepared for strengthening and extending the stone jetties at the mouth of Herring River at West Harwich; for improving the entrance to Cotuit Harbor; for dredging a channel at Harbor View, East Boston; and for dredging an anchorage basin for yachts at Lynn.

**Boston & Albany Railroad.**—WORK IN PROGRESS.—*East Boston Terminal.*—Pier No. 3 (For the use of the Cunard Steamship Company).—This has been completed and placed in operation since the last *Monthly Bulletin*.

Grain galleries under construction.

Pier No. 4 (For the use of the Leyland Steamship Company).—The superstructure for this pier is under construction, and the pile driving, concrete foundations, concrete floor and general timber work for the foundations are in progress. Contract for superstructure has been awarded and the work is proceeding rapidly.

**Yard Work:** The general revision of the track work is in progress, and is as far advanced as is consistent with the expeditious handling of other work.

**Grain Elevator:** The temporary grain transfer and a system of galleries for handling grain from that point has been completed and placed in operation, pending the construction of a 1,000,000 bushel grain elevator. The foundation work of this permanent elevator is under way and the pile driving well advanced.

**Water Tower:** Contract for the emergency fire service and water tower has been let and it is expected that the construction will be commenced soon.

**Porter Street Freight House and Team Delivery Yard:** This is practically complete and is expected to be put in service during the present month.

**New Engine House:** Contract for new engine house has been let and work has recently been commenced. This new engine house is to take the place of the old one at the terminal

which had to be removed for additional space for general improvements.

*Allston, Mass.*—Beacon Park Yard: The general rearrangement of this yard, including the construction of a culvert of seven (7) foot span of about six hundred (600) feet in length, the construction of scale pits, water station, and new ash pit in connection with new round house are well under way and will be put in operation soon.

A brick Yard Master's office building is being constructed at this point, and an electric interlocking tower will be constructed to facilitate the train movements at the west end of this yard.

*Brighton, Mass.*—Retaining wall to permit putting in switching track is being constructed and is practically completed.

*West Springfield, Mass.*—Yard: General Rearrangement: This work, including the lengthening of several bridges, construction of scale pit and auxiliary tracks, as well as grading and track work, is well under way.

Engine Terminal Facilities: A new eight hundred (800) ton coaling plant, new ash pits and 21-stall engine house, 85-foot turntable and auxiliary buildings, including machine shop, blower and compressor plant, offices and lavatories were completed and put in service on the 9th day of August, 1909.

Invitations for bids on oil house are about to be sent out to contractors, and contract has been awarded for the construction of a Yard Master's office and new signal tower at the west end of yard to protect yard movements.

**City of Boston.**—ENGINEERING DEPARTMENT.—*Huntington Avenue Bridge.*—The old iron plate girder bridge on Huntington Avenue over the tracks of the Boston & Albany Railroad, after thirty-seven years' service, is being removed and replaced by a modern steel structure.

The destructive effects of locomotive gases are strikingly apparent in the ironwork of this old bridge. In many places holes of considerable size are found in the webs of the iron girders, the metal having been completely eaten away by the fumes, and the strength of the girders having been reduced nearly 50 per cent. This corrosion has been much more rapid in the last few years than it was previously, owing probably to the different quality of coal used on the locomotives; and, while the old structure has been safe up to the present time, it would have



been decidedly unwise to have continued it in service for another year. Some of the old girders are still in place and can be examined for a few days longer.

The new bridge will consist of sixteen heavy steel girders, between which will be placed steel floor beams. All of the steel work is to be protected from the action of the locomotive gases by a covering of concrete, the protection of the steel being similar to that adopted in the floor beams of Boylston Street Bridge built last year. This concrete covering precludes the necessity of frequent painting of the metal work, and as it will effectually prevent the gases from reaching the steel, it is considered to be the most durable form of construction which can be adopted for such a bridge. Concrete arches will form the under flooring of the bridge and the roadway surface will consist of a brick pavement, while the sidewalks will have a surface of asphalt. Iron railings will replace the unsightly wooden fences of the old bridge. Some of the new girders are now in place, and the contrast in size between the old and new girders is very marked.

The work of reconstruction will be carried out so as to provide for highway and street car travel throughout the work, and the time required will necessarily be longer than would have been the case had it been possible to have closed the bridge to all travel. A temporary car track has been laid on the new steel work at the westerly side of the roadway, and work on the central portion of the bridge is to be carried through to completion. It is expected that both permanent car tracks will be ready for use by September 27. The westerly and central portions of the bridge will be completed early in October, after which the easterly side of the bridge will be reconstructed. The whole work is expected to be completed about the end of October.

*Chelsea Street Bridge.*—This bridge, which connects East Boston and Chelsea, was destroyed in the big Chelsea fire of 1908; see the May *Bulletin* of that year. It is being rebuilt on the old lines except that the channel is now 60 instead of 36 feet wide. The fixed portions are complete; these are pile structures. The draw is being erected. It is of the center bearing swing type, a riveted steel structure on a pile foundation, 30 feet wide between centers of the through plate girders and 175 feet long. The outer ends of the girders are supported by a central tower and eyebar Samson rods. The floor beams are 30-inch Bethlehem girder beams. The stringers generally are standard I-beams, the flooring

of wood. The roadway is to carry two trolley tracks of the Boston Elevated Railway Company, and there is to be a single sidewalk 6 feet wide.

**Boston Elevated Railway Company.**—ELEVATED AND SUBWAY CONSTRUCTION. — *Sullivan Square Station.* — Application has been made to the Railroad Commissioners for privilege to make changes at this station which will allow for the handling of eight-car trains, as well as a connection with the proposed Malden Extension.

*South Station.*—The extensive alterations at this point are nearing completion. The new arrangement provides for two entrances and two exit stairways located near the center of the new eight-car platform. This departure from the old layout, together with the additional ticket selling capacity, should permanently relieve the present annoying traffic congestion. The new canopy is planned to cover a six-car train.

*Dudley Street Station.*—Rapid progress is being made on the alterations and additions at Dudley Street. The new west pavilion is being erected, the alignment of the west elevated surface loop having been recently changed to accommodate the standard semi-convertible cars. With the completion of the new scheme, the crowds will be separated by means of loading and unloading platforms, thereby ensuring ideal conditions for handling the rush hour traffic.

*Forest Hills Extension.*—The concrete structure across the Arborway is completed with the exception of tooling the exterior faces of the balustrade and soffits which is now in progress with pneumatic chipping hammers. Waterproofing the train floor and the construction of the track system are under way. At the Forest Hills Station all the concrete work in the station proper is completed and a large portion of the carpenter work. It is probable that the station will be nearly completed within a short time. Active work has been commenced upon the leads and incline to the Forest Hills yard and the construction of a portion of the yard itself is to be commenced within the near future.

**East Cambridge, Mass.**—The Aberthaw Construction Co. are just putting on the roof to the Carter's Ink Co.'s building, Densmore & LeClerc, Engineers. Heavy cornice and parapet walls being built; job quite worth studying for extremely efficient

mixing plant; built-up unit reinforcement being used throughout the job. Metal lath partitions, interior carpentry and plumbing going in. The whole job was laid out to schedule before starting and is being completed on time. It is worth studying as a typical and unusual reinforced concrete job.

**New Haven, Conn.**—The Aberthaw Construction Co. are putting up for the Winchester Repeating Arms Co. two buildings exactly alike. There is duplicate equipment and the same number of men on each job. Competition has brought the mixing of concrete down to 256 batches through one mixer; last of the concrete being put in place; carpentry work starting; good system of hangers for supporting shafting and pipes.

**East Watertown, Mass.**—The Aberthaw Construction Co. are just starting work on a rush job for the Hood Rubber Co. It is to be a reinforced concrete building, with temporary roof built over the third floor. Building is designed for future additions. Henry F. Bryant, Architect.

**Lisbon Falls, Me.**—Simpson Bros. Corp. are building a reinforced concrete standpipe 50 feet diameter and 62 feet high of the same diameter and general design as the Manchester standpipe just completed by them.

**Springfield, Mass.**—*Little River Water Supply.*—September marks the completion of the concrete arch dam and the lining of the tunnel on the contract of F. T. Ley & Company on the new Little River Water Supply for Springfield. This contract will be entirely completed during the month.

The other contracts nearing completion on this supply are the three acres of filters under construction by the Charles R. Gow Company and the distributing reservoir on Provin Mountain by the Baker Contracting Company.

The twelve miles of 42-inch pipe line is completed with the exception of the river crossings of the Westfield River and Slab Brook which will take the remainder of the season to finish. The storage reservoir being constructed by Coleman Bros. and the Connecticut River Crossing (The T. A. Scott Company) are both well advanced and should be completed at the close of the season.

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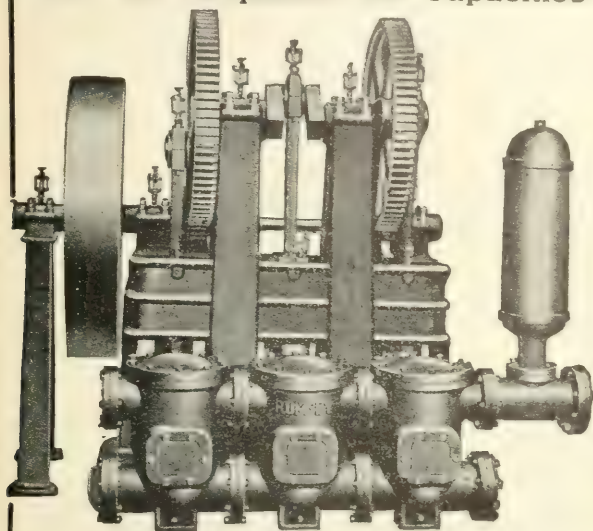
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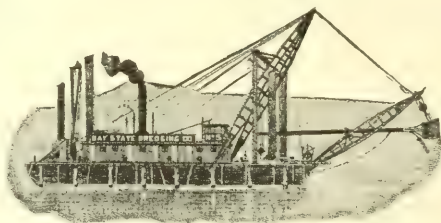
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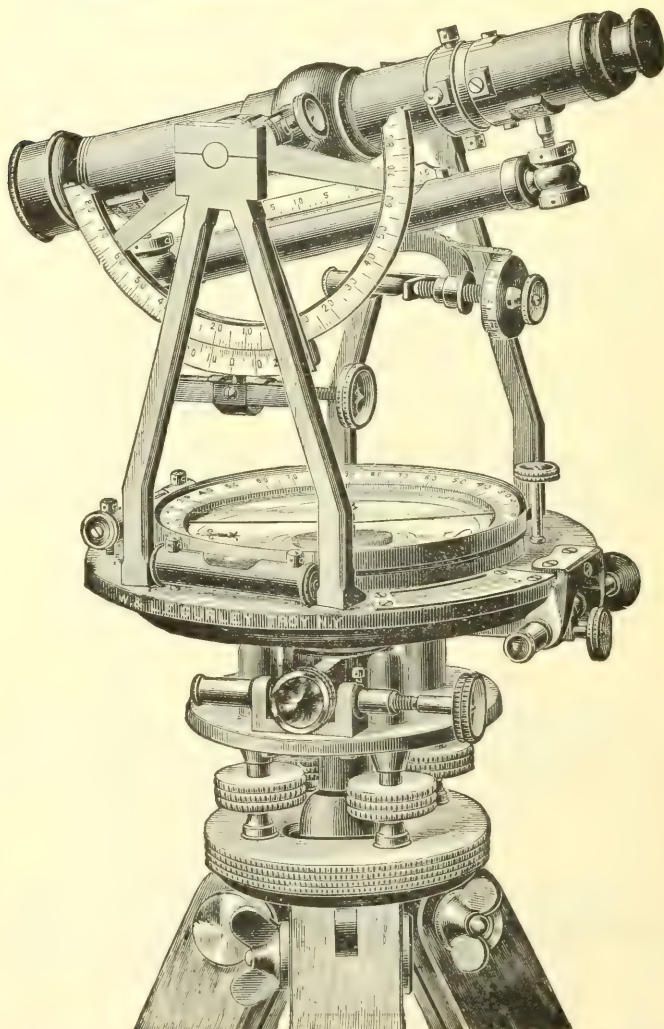
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**BOSTON SOCIETY OF CIVIL ENGINEERS.**

ORGANIZED JULY 3, 1848.

# MONTHLY BULLETIN.

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NEW SERIES.

OCTOBER, 1909.

No. 35

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## REGULAR MEETING.

A regular meeting of the Boston Society of Civil Engineers will be held on Wednesday, October 20, 1909, at 7.30 p. m., in  
CHIPMAN HALL, TREMONT TEMPLE, BOSTON.

**BUSINESS OF THE MEETING:** To ballot on the applications for membership as announced in this notice.

At eight o'clock a joint meeting will be held with the Boston Section of the American Society of Mechanical Engineers at which a paper will be presented prepared by Messrs. Gaetano Lanza and Lawrence S. Smith, entitled "Comparison of the Results Obtained by the Use of Three Theories of the Distribution of the Stresses in Reinforced Concrete Beams with the Experimental Results."

S. E. TINKHAM, *Secretary.*

## EXCURSION.

There will be an excursion of the Society on Wednesday afternoon, October 20th, to the Charles River Dam and other work of the Charles River Basin Commission at the Fenway.

Since our last visit to these works in April, 1908, much progress has been made. The dam with draw-bridge, lock, regulating sluices, etc., is nearly completed. The new Charles River embankment, with granite and concrete sea wall, the marginal conduit, Stony Brook gate house, Fens Pond Bridge, etc., are other interesting features which are substantially completed.

Members who attend this excursion are requested to meet at the foot of Leverett Street at the Charles River Dam at 2.30 p. m. (Take any East Cambridge Car.) Launches will be provided for transportation from the dam to the Fenway. Members are requested to wear excursion badges.

EXCURSION COMMITTEE.

## COMING REGULAR MEETINGS.

The following preliminary announcement is made of papers to be read at early regular meetings of the Society :—

NOVEMBER 17, 1909.—“Waterproofing of Engineering Structures,” by Joseph H. O'Brien.

“The Use of Manard Steel in Railroad Track,” by Mr. G. S. Vickery of the Pennsylvania Steel Co.

DECEMBER 15, 1909. — Bridge Meeting. “An Account of the Tyng's Island Suspension Bridge, near Lowell, Mass.,” by Mr. Thomas of the Westinghouse, Church, Kerr Co.

“The Bellows Falls Arch Bridge,” by J. R. Worcester.

JANUARY 26, 1910. —“Hydraulic Power Development with special reference to Ambursen Dam Construction,” by W. L. Church.

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## INFORMAL MEETINGS.

The practice, which has proved acceptable in former years, of holding informal meetings in the Society's Library on Wednesday evenings not assigned to the regular meetings of the Society and the Sanitary Section will be continued this winter. In the November *Bulletin* the subjects for discussion at the first of these meetings will be announced.

Members are requested to notify the Secretary of subjects which they think will be of interest to have presented. It is hoped that many of the members who have recently joined the Society will speak about matters which have come to their knowledge, even if but a short time would be needed in which to treat them as arrangements can be made to have a number of topics taken up in a single evening.

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## REPORT OF METROPOLITAN IMPROVEMENTS COMMISSION.

Mr. Desmond FitzGerald, a member of the Metropolitan Improvements Commission, has a few extra copies of the report recently issued by that Commission, which he will be glad to furnish to members applying to him.

## MEETING OF THE BOSTON SECTION, AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS.

The first meeting of the Boston Section of American Institute of Electrical Engineers will be held on Wednesday evening, Oct. 20, at 8.00 p. m. at the auditorium of the Edison Building, 390 Boylston Street. Mr. J. B. Taylor of the General Electric Company of Schenectady, N. Y., will present his paper, "Telegraph and Telephone Systems as Affected by Alternating Current Lines."

Members of the Boston Society of Civil Engineers are cordially invited to attend this meeting.

### CANDIDATES FOR MEMBERSHIP.

To be balloted on at meeting Oct. 20, 1909.

#### AS MEMBERS.

**THEODORE MERRITT BEACH**, Springfield, Mass. (b. 1882). Received his education in the New York State Normal School, leaving in the fall of 1900. Began engineering work in the spring of 1901 as rodman for the B. & O. R. R. Co.; from spring of 1902 to summer of 1903 transitman for Penn. R. R. Co.; summer of 1903 to summer of 1906 assistant engineer for the City of New Castle, Pa.; summer of 1906 to date has had charge of surveying party for City of Springfield, Little River Water Supply. Recommended by T. W. Norcross, E. E. Lochridge, C. R. Gow and D. M. Wood.

**WILLIAM H. ELLIS, JR.**, Boston (b. 1884). Attended public schools of Boston, including the Mechanic Arts High School. Began work with W. H. Ellis, general contractor in 1902, as timekeeper and assistant in estimating; in 1904 with B. & M. R. R. as rodman and after 8 months was made transitman, which position he held for two and a half years; at present estimating and superintending on outside work for W. H. Ellis & Son. Recommended by J. N. Ferguson, F. P. Spalding, A. E. Tarbell and M. T. Cook.

**WILLIAM FREDERICK FARLEY**, Waltham, Mass. (b. 1883). Graduate in civil engineering, Massachusetts Institute of Technology, 1906. From June, 1906, to September, 1907, with Ambursen Hydraulic Construction Co.; September, 1907, to February, 1908, assistant engineer with New York State Water Supply Commission; February, 1908, to February, 1909, with New York State engineer and surveyor as assistant engineer on highway construction; and at present with Boston Elevated Railway Co., office of chief engineer, elevated lines. Recommended by H. L. Caborn, C. T. Fernald, E. M. Moses and L. S. Cowles.

OREN LESLIE GOODRIDGE, Houlton, Me. (b. 1882). Received B. S. and C. E. degree from University of Maine, June, 1903. From June, 1903, to April, 1906, rodman and instrument man, Bangor & Aroostook R.R.; April, 1906, to September, 1906, leveler on location Great Northern Railway; September, 1906, to March, 1907, instrument man M. of W. Department, Chicago & Northwestern R. R., and March, 1907, to present assistant engineer M. of W., Bangor & Aroostook. Recommended by H. S. Boardman, H. S. Ferguson, J. W. Tower and Moses Burpee.

EDWARD RUDDOCK HYDE, Somerville, Mass. (b. 1883). Graduate of Massachusetts Institute of Technology, 1906, and since that date with the civil engineering department of the Fore River Shipbuilding Co. Recommended by C. W. Sherman, Leonard Metcalf, W. T. Barnes and J. F. Wilber.

DANIEL PATRICK KELLEY, Boston (b. 1884). Graduated from Mechanic Arts High School in 1901, post-graduate course in 1902, and at Massachusetts Institute of Technology 1902-1904. From June to December, 1904, with H. H. Carter of the Metropolitan Contracting Co. on construction of concrete conduit, Back Bay Fens, the widening of Atlantic Avenue, construction of Boston & Maine Docks; during the next year was engineer for John A. Costello, contractor, on sewer and street construction; from February to October, 1906, with Mark H. Lynch, general contractor, and since October, 1906, with Charles River Basin Commission on construction work of the dam and lock. Recommended by J. A. Holmes, J. N. Ferguson, H. M. McCue and R. W. Emerson.

JOHN LEROY MANN, Monte Cristi, Dominican Republic, W. I. (b. 1872). A. B., Dartmouth College, 1894; C. E., Thayer School of Civil Engineering, 1898; Albany Filtration Plant, 1898-1899; instructor, associate professor, Thayer School Civil Engineering, 1899-1904; U. S. Reclamation Service, 1904-1907; Ingeniero Director Servicio Irrigacion en Monte Cristi, Dom. Republic to date. Recommended by W. H. Balch, M. F. Brown, J. G. Andrews and J. P. Snow.

STANLEY A. MILLER, Azua, Dominican Republic, W. I. (b. 1882). Student in engineering courses, Louisiana State University, 1897-1900; Associate member American Society Civil Engineers and member N. E. Waterworks Association; 1900-1901, rodman, instrument man and inspector on railroad and sewerage work in Louisiana; 1901-1902, assistant engineer Mobile, Ala., on sewerage and asphalt pavements; 1902, instrument man on railroad location in Alabama and Florida; 1903, assistant engineer to Charles B. Davis, constructing engineer New York, investigating and designing waterworks and sewerage for Dallas, Tex., and South Macalester, Okla., and irrigation at Victoria, Tex.; 1904-1906, resident engineer in charge, on railroad terminals and hydro-electric work in Mexico; 1906-1908, resident engineer trunk line sewers at Cairo, Ill., and Paducah, Ky., and on two high dams in California and Colorado for hydro-electric developments; and February, 1909, to date, engineer in charge of hydraulic studies, preliminary to construction of



irrigation schemes (one million dollars involved) under general direction of H. F. D. Burke, late division engineer, Pann T. and T. Co. Recommended by W. H. Balch, A. B. MacMillan, W. M. Dilling and C. T. Huggins.

CHARLES WELLMAN ROBINSON, Winthrop, Mass. (b. 1878). Finished public school education at Medway High School, private tuition in architectural work, 1904 and 1905; Y. M. C. A. course and private tuition in mathematics and theory of structures, 1906 and 1907; August, 1905, to September, 1906, draftsman, granite work, at Norcross Plant, Milford, Mass.; September, 1906, to February, 1907, structural draftsman, Builders' Iron & Steel Co., East Cambridge; February, 1907, to August, 1909, structural draftsman, Boston Elevated Railway Co., and now with Boston Bridge Works. Recommended by J. C. Moses, E. R. Olin, A. F. Brown and L. S. Cowles.

CONANT W. RUTH, Wakefield, Mass. (b. 1884). Educated at Rickes Academy and at Tufts College. From spring to fall, 1906, transitman with Bangor and Aroostook R.R., and from fall of 1906 to 1907 with Boston & Albany R.R.; spring of 1907 to spring of 1908 with Stone & Webster Engineering Corporation, and at present with Orville Signal Co. as engineer. Recommended by H. P. Wilson, J. I. Tucker, W. C. Whitney and W. G. S. Chamberlain.

HARRY FRANCIS SAWTELLE, Cambridge, Mass. (b. 1875). Graduate Massachusetts Institute of Technology, 1898. From 1898 to 1903 draftsman; 1903 to 1906 assistant engineer Cambridge Bridge Commission; 1906 to July, 1907, engineering department, Am. Tel. & Tel. Co.; July, 1907, to April, 1909, inspection department, Asso. Factory Mutual Fire Ins. Cos.; and April, 1909, to date engineer's office, Cambridge, Main St. Subway, Boston Elevated Railway Co. Recommended by F. H. Fay, S. E. Tinkham, G. A. Kimball and L. S. Cowles.

CHARLES EDWARD FRANKLIN STETSON, Houlton, Me. (b. 1850). From 1874 to 1877 student, chainman, rodman and instrument man in office of Col. J. Albert Monroe, Providence, R. I.; 1881-1885 assistant engineer, N. Y. W. S. & B. R. R.; 1887-1888 engineer in charge of surveys and construction, Houlton, Me. sewers; 1889-1890 County Commissioner of Aroostook County, Me., and from 1891 to present time assistant engineer, locating engineer, construction engineer and principal assistant engineer Bangor and Aroostook R.R. Recommended by H. S. Ferguson, J. W. Tower, E. L. Corthell and Moses Burpee.

#### APPLICATIONS FOR MEMBERSHIP.

The following applications for membership have been received and are now before the Board of Government for approval. Members having information which will assist the government in its consideration of these applications are requested to communicate at once with any member of the Board. Communications will be regarded as confidential and for the use of the Board alone.

#### AS MEMBERS.

WALTER CHALONER DUFFEE, Jamaica Plain, Mass. (b. 1885). Received A. B. at Harvard in 1904 and A. M. in 1905. Graduated at Harvard as Austin

Teaching Fellow in Engineering until 1907; June to September, 1907, in tunnels of Pennsylvania and Long Island R. R., New York; from September, 1907, to present date, with Walworth Manufacturing Co. as experimental engineer. Recommended by Edmund S. Davis, G. D. Emerson, A. M. Mattice and L. J. Johnson.

CHARLES HENRY DUTTON, Waltham, Mass. (b. 1873). From 1891 to 1897, with Smith & Brooks of Lowell, Mass.; 1897 to 1901, at Lawrence Scientific School; 1901 to 1902, with Metropolitan Water and Sewerage Board; 1903 to 1906, with City of Manila, P. I.; three months in 1907 with American Bridge Co.; and September, 1907, to date, with J. R. Worcester & Co. Recommended by Melvin B. Smith, Ernest P. Whitten, Ira N. Hollis and Lewis J. Johnson.

HERBERT THURSTON GERRISH, Melrose, Mass. (b. 1886). Graduated from the Massachusetts Institute of Technology, 1908; summers of 1904 to 1907, and since graduation, with the Eastern Dredging Co., 247 Atlantic Avenue, Boston. Recommended by James W. Rollins, Jr., Frank W. Hodgdon, Frederic H. Fay and C. Frank Allen.

PHILIP HEDENBERG LADD, Medford, Mass. (b. 1885). Educated at High School, Medford, Mass., and attended University of Tucson, Arizona, for two years, taking the civil engineering course; worked on preliminary location and construction of survey for railroads in Arizona, New Mexico and Mexico, for the past four years, having been rodman, leveler, topographer and transit man on that work; at present employed as transit man on the Cambridge Subway construction. Recommended by W. T. Wiley, Ralph E. Rice, Frank H. Carter and George A. Kimball.

BERNARD SHAFFNER ROSE, Cambridge, Mass. (b. 1883). Rodman in City Engineer's office, Providence, R. I., June, 1902, to November, 1902; instrument man, inspector and chief of party for Mr. O. Perry Sarle, C. E., Providence, R. I., from April, 1903, to January, 1907; took special course in Brown University while with Mr. Sarle, from September, 1905, to January, 1907; detail draughtsman with Boston Bridge Works from January, 1907, to September, 1908; now employed by Boston and Albany R. R. as chief of party on the East Boston Pier Improvements. Recommended by J. B. Russell, J. C. Moses, H. M. Chadwick and F. P. Morrill.

EDWARD EVERETT SAVORY, Newtonville, Mass. (b. 1878). Studied mechanical engineering at Harvard University and afterwards at home while in the employ of Harvard University under Prof. W. S. Burke; have studied concrete, both plain and reinforced; at present employed in the Portland Cement business. Recommended by J. R. Worcester, E. E. Pettee, Arthur W. Hodges and Chester J. Hogue.

WILLIAM THOMAS SHAW, Middleboro, Mass. (b. 1880). Received B. S. from Dartmouth in 1904 and C. E. from Thayer School of Civil Engineering in 1906. From June to November, 1906, employed by Charles River Basin Commission; November, 1906, to December, 1908, with Cumberland Valley Railroad; since May as transitman for Boston Elevated Railway; and at present engaged on computation relating to Cambridge Main Street Subway. Recommended by George A. Kimball, Ralph W. Loud, Ralph E. Rice and Frank H. Carter.

**GEORGE REED WADSWORTH**, Brookline, Mass. (b. 1875). Graduated from Massachusetts Institute of Technology, 1898; June, 1898, to May, 1905, with New York Central & Hudson River R. R. as follows: June, 1898, to March, 1899, transitman; March to November, 1899, assistant supervisor of track; November, 1899, to February, 1901, assistant engineer, middle division, Albany, N. Y., in charge of yards and engine house lay-outs and bridge masonry and renewals, etc.; February to June, 1901, assistant to engineer of track, Grand Central Station, designing, etc.; June, 1901, to April, 1902, resident engineer, middle district, at Albany, in responsible charge of contract work, including sewer through Albany Basin, substructure renewal of freight bridge across Hudson River, passenger station at Troy, N. Y., and brick car-shops at West Albany; April, 1902, to February, 1903, designing engineer, Grand Central Station, in charge of designs and estimates; February, 1903, to February, 1905, assistant engineer on terminal improvements in New York City, in responsible charge on Port Morris Depression, including 500-ft. double-track rock tunnel, 1 500-ft. double-track concrete arch-roof subway, also Marble Hill Cut-off, and designs and schemes for four-tracking and re-alignment in Electrification Zone; February to May, 1905, resident engineer, Hudson district, in responsible charge of contract work on terminal improvements from Mott Haven to Croton-on-Hudson; May, 1905, to November, 1907, with J. G. White & Co., Inc., New York City, in construction department, on steam and electric railroad construction, irrigation projects, wharves, dams, etc.; December, 1907, to March, 1909, engineer for Metropolitan Improvements Commission of Massachusetts, on investigation and report on passenger and freight steam railroad systems, with allied water-front facilities within Metropolitan District of Boston and recommendations for joint development of properties; May, 1909, to date, engineer East Boston Co., Boston, in charge of preparation of plans and estimates for proposed docks, wharves, railroads, etc., along water front of East Boston. Recommended by Alfred E. Burton, C. H. Pease, H. L. Coburn and C. B. Breed.

**JOHN MAURICE WISEMAN**, Cambridge, Mass. (b. 1884). Graduate of Cambridge Latin School, class of 1903; attended Massachusetts Institute of Technology, 1903 to 1904; summer of 1905, Harvard Engineering camp; 1905 to 1907, with Bureau of Elevated and Subway Construction; 1907 at Lawrence Scientific School; and at present transitman with Bureau of Elevated and Subway Construction, Boston Elevated Railway, Cambridge Main Street Subway. Recommended by Ralph W. Loud, George A. Kimball, Frank H. Carter and Edward E. Albee.

## MINUTES OF MEETING.

### SEPTEMBER MEETING OF THE SOCIETY.

BOSTON, SEPT. 15, 1909. — A regular meeting of the Boston Society of Civil Engineers was held at Chipman Hall, Tremont

Temple, at 8 o'clock P.M., President George B. Francis in the chair; eighty-eight members and visitors present.

The record of the last meeting was read and approved.

The President announced the death of Edwin W. Ellis, a member of the Society, which occurred on Aug. 3, 1909, and appointed the following members a committee to prepare a memoir, Messrs. Lewis M. Hastings and John N. Ferguson.

Mr. Holmes, for the committee to prepare a memoir of Charles D. Elliot, read its report.

On motion of Mr. Fay, the Secretary was directed to tender the thanks of the Society to those who had placed automobiles at the service of the committee appointed to entertain members of the American Society of Civil Engineers attending the Convention at Bretton Woods who might come to Boston. Cars were furnished by the Metropolitan Water Board, Mr. Charles S. Sergeant, vice-president of the Boston Elevated Railway Co., Mr. Harry P. Nawn and by the following members of the Society, William L. Miller, Frederic P. Stearns, Frank A. Barbour and George A. Kimball.

The thanks of the Society were also voted to the officials of the Boston & Albany Railroad Company for courtesies extended this Society on the occasion of the visit of the members to the East Boston Terminal Improvements.

The paper of the evening was by Mr. James W. Rollins, Jr., and was entitled, "Building the Shut-off Dam at the Charles River Basin."

The discussion following the reading of the paper was participated in by Messrs. Harold P. Farrington, Frederic H. Fay and Pres. George B. Francis. The paper and discussions were illustrated by lantern slides.

Adjourned.

S. E. TINKHAM, *Secretary*.

## OCTOBER MEETING OF THE SANITARY SECTION.

Boston, Oct. 6, 1909:—A regular meeting of the Sanitary Section was held at the Boston City Club.

The meeting was called to order at 7.30 P.M. by Chairman F. A. Barbour. Mr. Alexis H. French read a paper descriptive of the Brookline Comfort Station. Following Mr. French, Mr.



Arthur D. Marble read a description of the Comfort Station at Lawrence. Both of these stations were novel in design, and the papers were illustrated with large scale drawings and photographs. Many details of design of such structures were described and methods and cost of operation were discussed.

Mr. Harvey of the J. L. Mott Iron works discussed a few of the debatable points in connection with the plumbing fixtures for public purposes. Regarding the type of urinal, he stated that he preferred the long porcelain wall type to the individual bowl type on account of the better washing of the surface around and below the point of approach. He preferred glazed surfaces to marble partitions. Regarding closets he said that the matter of flushing the water and the finish of the seat were matters of debate. The integral seat, he said, was not a success. When placed in institutions they were frequently covered with all sorts of wooden or textile seats. The seat having part of its circumference wooden and part porcelain is the latest devise and is an effective compromise between the integral seat and the all wooden seat. Mr. Harvey stated that a cleanly appearance is of the most importance in design of public comfort stations, where not only must the premises be kept clean but must be so built that the presence of any dirt will be so noticeable that its immediate removal will be obligatory. In his opinion all general apparatus for flushing should be in a separate room. He approved of automatic seat flush tanks and believed that flush valves in connection with closets were fully as reliable as the ordinary flush tank and chain. Mr. Harvey said that the flush tanks appealed to him in cases where the closets were flushed frequently. In many places the period between usings does not permit the flush tank to completely fill.

Mr. Bunting described several types of fixtures which in his experience had proved to be most satisfactory. He did not like the siphon urinal of the Terminal Station type on account of the large volume of water contained in it permanently, nor the wall type on account of the liability of portions of the surface thereon becoming foul because of inadequate distribution of water.

Mr. Humphrey described "Kleen Spra" videt.

Messrs. Joseph Enright Conboy and Joseph B. Stewart, Jr. were elected members of the Section.

About twenty-seven members and guests were present. In the afternoon the Section enjoyed an excursion to Brookline,



where the comfort station, the new transfer station, the new water works reservoir, and also some deep sewer construction were inspected under the guidance of Mr. Alexis H. French, Town Engineer.

ROBERT SPURR WESTON, *Clerk.*

## LIBRARY NOTES.

### RECENT ADDITIONS TO THE LIBRARY.

#### United States Government Reports.

Telegraph Systems, 1907.

#### State Reports.

New York Report of Advisory Board on Barge Canal, 1908.

#### City and Town Reports.

Kansas City, Mo., Annual Report Department of Public Works, 1908.

Louisville, Ky., Water Co., Annual Report for 1908.

Reading, Pa., Annual Report Water Commissioners, 1908.

Toronto, Canada, Annual Report City Engineer, 1908.

#### Miscellaneous.

Concrete Inspection. Charles S. Hill.

FREDERIC I. WINSLOW, *Librarian.*

### LIST OF MEMBERS.

#### ADDITIONS.

ROBERT B. BELLAMY	.	.	.	17 Bowdoin St., Dorchester, Mass.
CLIFFORD N. COCHRANE	.	.	.	63 Howard St., Melrose, Mass.
JOHN F. OSBORN	.	.	.	314 Harvard St., Cambridge, Mass.
EDWARD H. ROCKWELL	.	.	.	Tufts College, Mass.
EZEKIEL C. SARGENT	.	.	.	92 Revere Rd., Quincy, Mass.
HARRY P. WILSON	.	.	.	52 Hildale Rd., Tufts College.

#### CHANGE OF ADDRESS.

H. BISSELL	.	.	Engineer's Office, B. & M. R. R., Boston, Mass.
J. E. CUNNINGHAM	.	.	9 Willow St., Boston, Mass.
R. W. EMERSON	.	.	111 Bayly Ave., Louisville, Ky.

H. P. FARRINGTON	Care of Viele, Blackwell & Buck, 49 Wall St., N. Y.
E. M. FRENCH . . . . .	76 Pierrepont St., Brooklyn, N. Y.
J. H. GREGORY . . . . .	92 Park Place, Newark, N. J.
O. W. HARTWELL . . . . .	Box 972, Salt Lake City, Utah.
H. K. HIGGINS . . . . .	9 Elm Lawn, Dorchester, Mass.
H. G. HUNTER . . . . .	The Gladstone, Dorchester, Mass.
A. E. KIMBERLY . . . . .	Columbus Savings & Trust Bldg., Columbus, O.
F. P. MORRILL . . . . .	29 Wendell St., Cambridge, Mass.
T. W. NORCROSS . . . . .	42 Magoon Ave., Medford, Mass.
ROBERT A. SHAILER . . . . .	304 Paddock Bldg., Boston.
E. R. SIMPSON . . . . .	490 North St., Pittsfield, Mass.
SIDNEY SMITH . . . . .	966 Baxter Ave., Louisville, Ky.
G. F. SWAIN . . . . .	Pierce Hall, Oxford St., Cambridge, Mass.
FRANCIS C. TUCKER . . . . .	Pavillion, Fremont Co., Wyo.
G. A. WETHERBEE . . . . .	Inglewood, Cal.

## DEATH.

WILLIAM PARKER . . . . .	Died Sept. 30, 1909.
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## NEW ENGINEERING WORK.

(Under this head the Excursion Committee proposes to present each month a brief résumé of engineering work in progress in New England, as far as such information is readily obtainable. The assistance of members is desired, and items of interest will be gladly received. Such items are intended to include not only works of exceptional magnitude or containing novel features, but also engineering construction work of all kinds and all degrees of magnitude. Notes should be in the hands of the Committee not later than the 1st Wednesday of each month. The thanks of the Committee are due to the members who have furnished data for the Bulletin.—FRANK H. CARTER, Secretary, Excursion Committee, 147 Magazine Street, Cambridge, Mass.)

**Commonwealth of Massachusetts.**—**CHARLES RIVER BASIN COMMISSION.**—*Work in Progress at the Dam and Lock.*—With the exception of the coping stones the harbor and basin walls are entirely completed and the roadway filling is also nearing completion. A retaining wall is being built between piers 10 and 11 of the Boston Elevated at the Cambridge end of the dam, and a retaining wall will shortly be started at the northerly end of the Charlesbank playground at the Boston end of the Dam.

*Boston Embankment.*—The roadway and embankment is completed from the Boston end of the new Cambridge Bridge as far as Otter Street. From Berkeley Street to Charlesgate West the work is completed except for the fence along the basin wall and the grading and seeding of the loam space.

*Dredging in Basin.*—At Watertown dredging continues both above and below the Galen Street Bridge.

**METROPOLITAN PARK COMMISSION.**—*Alewife Brook Purification.*—Work of excavating new channel for Alewife Brook is in progress.

Work of construction of concrete retaining walls between Broadway and Massachusetts Avenue is in progress.

*Mystic River Reservation.*—Grading, surfacing and other work for drives along Mystic River from High Street to Main Street is in progress.

Work of dredging for deepening and widening of channel of Mystic River is in progress.

**METROPOLITAN WATER AND SEWERAGE BOARD.**—*Water Works.*—*Supply Pipe Lines.*—Work is in progress on the new 60-inch pipe line which is being laid to reinforce the existing 48-inch supply main which extends from the Charles River, Newton, near the terminus of the Weston Aqueduct to the low-

service main in Beacon Street near the Effluent Gate-House at the Chestnut Hill Reservoir in Brighton. The total length of the new pipe line will be about 35,000 feet, of which about 8,000 feet is now under contract, and the work of laying the 60-inch pipe is in progress in Commonwealth Avenue and Chestnut Hill Avenue in Brighton, where the trench is in rock at several places.

A 60-inch Venturi meter will be set at the terminus of the line near the junction of Beacon Street and Chestnut Hill Avenue in Brighton.

*Northern High Service Pipe Lines.* — The new 24-inch northern high-service pipe line which is being laid from Broadway at High Street in Everett to Broadway at Fenno Street in Revere to reinforce the existing 20-inch pipe line, has been completed for a length of about 5,400 feet in Fenno Street in Revere and in Washington Avenue in Chelsea, and work is now in progress in Washington Avenue in Chelsea. The total length of the new pipe line will be about 12,300 feet.

HARBOR AND LAND COMMISSIONERS. — Work is now in progress as follows :

Dredging channel and anchorage basin at West Falmouth.

Building dike at Herring River, Wellfleet. The closure has been successfully made.

Building riprap of granite quarry grout to protect shore, which is washing away, at Chatham, Mass.

Strengthening with stone riprap the jetties at the mouth of Bass River at South Yarmouth.

Protecting with stone riprap the westerly bank of the Connecticut River at the Holyoke Canoe Club, at Smith's Ferry.

Building an extension to the stone breakwater at Vineyard Haven on Martha's Vineyard.

Dredging in the Annisquam River, Gloucester, to remove shoals from present channel between Wolf Hill and Gloucester Harbor, and to provide a new channel at Lobster Cove, Annisquam.

Building concrete sea wall on the beach at North Scituate.

Contracts will probably soon be made for dredging a berth in Reserved Channel, South Boston Flats, just above L Street Bridge, and for building a pile wharf at same place.

MASSACHUSETTS HIGHWAY COMMISSION.— Work is in progress in the following towns:—

## CONSTRUCTION.

Agawam,	Huntington,	Southampton,
Barnstable,	Lee,	Southboro,
Becket,	Marshfield,	South Hadley,
Charlton,	Montague,	Sterling,
Chester,	Newbury (Bridge),	Stockbridge,
Clarksburg,	Oxford,	Sturbridge,
Deerfield,	Palmer (Bridge),	Sunderland,
Duxbury,	Phillipston,	Swansea,
Eastham,	Pittsfield,	Templeton,
Falmouth,	Rochester,	Tyngsboro,
Hamilton,	Rowley,	Uxbridge,
Hatfield,	Salem,	Wareham,
Haverhill,	Scituate,	West Newbury.

## SURFACING.

Auburn,	Nantucket,	Sudbury,
Bourne,	Newburyport,	Swampscott,
Canton-Stoughton,	Norfolk,	Walpole,
Concord,	Norwood,	Watertown,
Dartmouth,	Orange,	Westminster,
Holden,	Paxton,	West Newbury,
Lee,	Quincy,	Weston,
Leicester,	Randolph,	West Springfield,
Lincoln,	Revere-Saugus,	Whately,
Marion,	Spencer,	Worcester.

**Boston Elevated Railway Company.**— ELEVATED AND SUBWAY CONSTRUCTION.— *Dudley Street Station.*— The steel-work for the new pavilion on the west elevated (surface car) loop is entirely erected and the carpenter work well along. Inasmuch as the Forest Hills Extension will doubtless be opened for traffic before the completion of the east pavilion (east surface loop), temporary provision is being made to care for the passengers who transfer from the elevated trains to the east loop surface cars.

*City Square and South Stations.*— The extensive alterations at these stations are completed and the accommodations now offered will no doubt be ample for any normal increased traffic.

*Forest Hills Station and Arborway.*— Work is substantially completed, and will be open for traffic soon. The foundations and steel work for the leads into the Forest Hills car yard are being constructed.

CAMBRIDGE MAIN STREET SUBWAY.— *Cambridge Bridge Incline.*— Work is well under way on the Cambridge Bridge Incline. About 150 feet of reinforced concrete retaining wall



section and about 75 feet of Subway is complete. Work on pipe changes has been commenced at different points. Pump wells are being constructed in advance of further subway construction.

*Dana Hill Tunnel.* — Drift walls have been driven towards Harvard Square for about 150 feet. Work is now awaiting the erection of the shield.

*Harvard Square Station.* — Cambridge Common Incline.

Gravity retaining walls on the open incline and the double barrel reinforced concrete section is well under way. Openings have been made at three other points in the square for the construction of the station proper.

**New York, New Haven & Hartford Railroad.** — WORCESTER: *Elimination of Grade Crossings.* — Work involving the construction of three reinforced concrete arches and two steel bridges is under way.

BOSTON: *Elimination of Grade Crossings.* — Work preparatory to the abolition of six crossings on the main line between Savin Hill and Neponset Station and four crossings on the Shawmut Branch between Harrison Square and Fields Corner Station has been started.

**Boston Transit Commission.** — It is expected that the work in progress about Oct. 15, 1909, will consist mainly of construction operations at the intersection of Grove and Phillips Streets on the Tunnel under Beacon Hill for the Cambridge Connection.

**City of Boston.** — ENGINEERING DEPARTMENT. — *Huntington Avenue Bridge.* — The rebuilding of the westerly portions of this bridge is almost complete; the easterly portion will be taken out and rebuilt within the next few weeks. See September *Bulletin*.

**Concord, Mass.** — WATER WORKS. — *Nagog Pond Supply.* (Work located in Acton, Mass.) The contract for pipe-laying, etc., noted in the June *Bulletin* has been substantially completed, except the work of reinforcing the dam and building the gate-house, and laying the intake pipe extending from the dam some 1700 feet into the pond. The present dam is an irregular structure of rubble masonry backed with earth; it is to be strengthened and slightly raised by sheathing it with concrete, incidentally bringing it to uniform lines and sections. This work has not yet

been begun, but will soon be in progress. The intake pipe will extend for some 1300 feet through a bay which is to be dammed off by a cofferdam, so that in this section the pipe-laying work will be practically dry. The balance of the intake will be sub-aqueous work and flexible jointed pipe will be used here. Construction of the cofferdam is now in progress.

**Springfield, Mass.** — *Little River Water Supply.* — Contract No. 1, including the concrete, arched diversion dam and the tunnel including the concrete lining were completed during the past month.

It is expected that the three acres of covered filters, Contract No. 2, and the Provin Mountain distributing reservoir, Contract No. 3, also the pipe line, Contract No. 4, will be completed during the present month, and the River Crossing No. 6 and the large storage reservoir at Borden Brook No. 5 should be substantially completed during the month following.

**East Cambridge, Mass.** — Concrete work completed on Carter's Ink Co.'s building, First Street, built by Aberthaw Construction Company. Various forms of finish for exterior concrete work very well illustrated: rubbed surface, picked face and concrete mouldings. Unusually attractive concrete front. Details of interior work worth consideration.

**East Watertown, Mass.** — *Hood Rubber Company.* — Second story in place on concrete building. Work being rushed for early completion. Handled by Aberthaw Construction Company.

**Charlestown Navy Yard.** — The test specimens of concrete of various mixtures and of various kinds of cement and aggregates for testing the effect of seawater on concrete have been in position at the Navy Yard for the past nine months. They are located near the old ship way at the upper end of the yard toward the receiving ship "Wabash." They are hung from along the outer edge of a wooden wharf, the tops always above high tide, the bottoms always below low tide. This is the most elaborate series of experiments undertaken in this line in this vicinity. The work was built at the expense of the Aberthaw Construction Company, under the direction of Mr. L. C. Wason and Mr. Herbert L. Sherman, Cement Chemist, and all supervised

by the Bureau of Yards and Docks of the Navy Yard. The tests will probably prove to be standards on the subject of the action of seawater on concrete. They are worth keeping in mind and will prove of interest after they have been in the water a few months longer.

**Buffalo, N. Y.**—Aberthaw Construction Company is building large addition to the Pierce Arrow Motor Car Co.'s plant, makers of the Pierce Arrow automobiles. This is a rush job located near the New York Central tracks; flat slab mushroom construction exterior.

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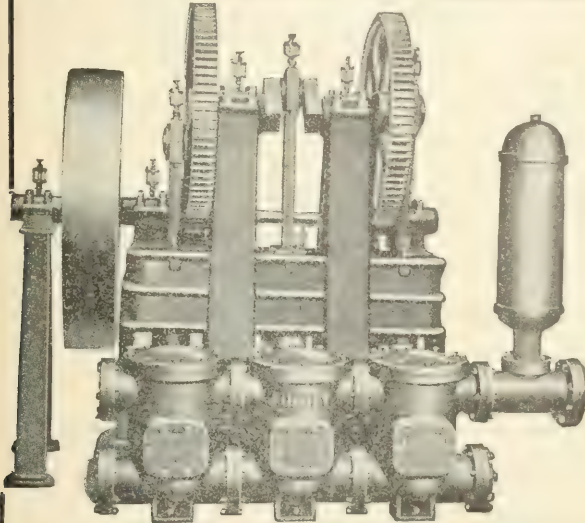
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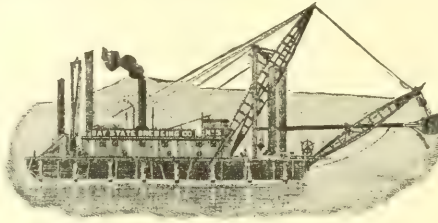
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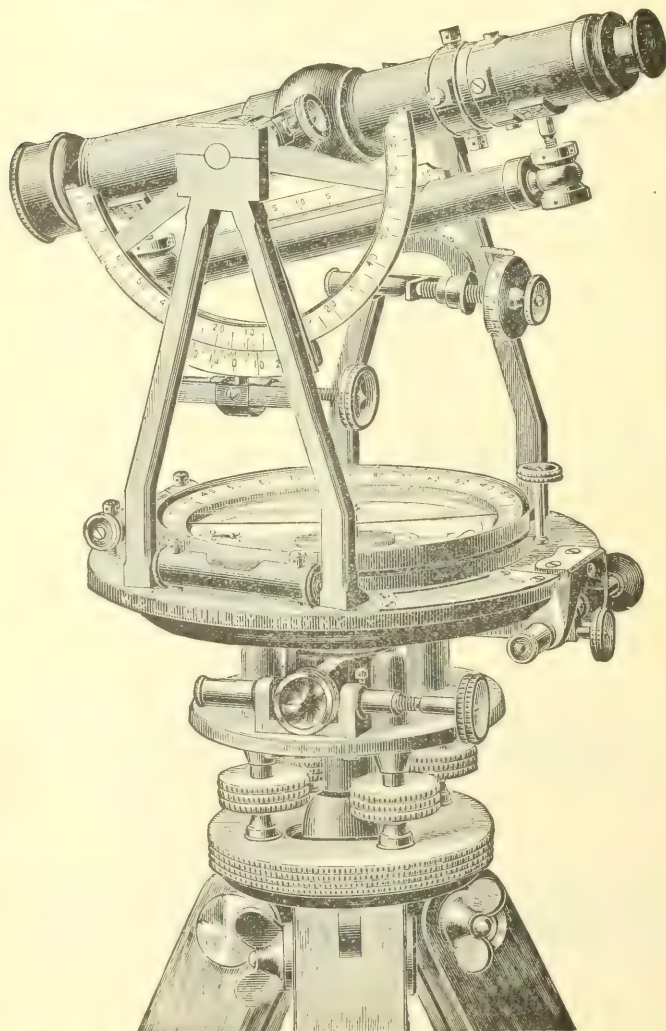
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# MONTHLY BULLETIN.

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NEW SERIES.

NOVEMBER, 1909.

No. 36

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## REGULAR MEETING.

A regular meeting of the Boston Society of Civil Engineers will be held on Wednesday, November 17, 1909, at 7.30 p. m., in  
CHIPMAN HALL, TREMONT TEMPLE, BOSTON.

**BUSINESS OF THE MEETING:** To ballot on the applications for membership as announced in this notice.

The following papers will be read:

"Waterproofing of Engineering Structures," by Joseph H. O'Brien.

"The Use of Manard Steel in Railroad Track," by Mr. G. S. Vickery of the Pennsylvania Steel Co.

The lantern will be used for illustrations of both papers.

S. E. TINKHAM, *Secretary*.

## EXCURSION.

There will be an excursion of the Boston Society of Civil Engineers to the works of the Metropolitan Park Commission along Mystic River and Alewife Park on Wednesday afternoon, Nov. 17, 1909. The party will meet at the North Station in time for the 1.47 train to Medford which arrives at Medford Square at 2.03 p. m. Members who prefer may take the Elevated to Sullivan Square where transfer should be made to cars for Medford or West Medford to Craiock Bridge which is about 200 feet from Medford Square. For a description of the work members are referred to the news item in this issue of the *Bulletin*.

EXCURSION COMMITTEE



### COMING REGULAR MEETINGS.

The following preliminary announcement is made of papers to be read at early regular meetings of the Society:—

DECEMBER 15, 1909. — Bridge Meeting. "An Account of the Tyng's Island Suspension Bridge, near Lowell, Mass.," by James W. Thomas of the Westinghouse, Church, Kerr Co.

"The Bellows Falls Arch Bridge," by J. R. Worcester.

"The Old Chain Bridge at Newburyport," by R. R. Evans.

JANUARY 26, 1910.—"Hydraulic Power Development with special reference to Ambursen, Dam Construction," by W. L. Church.

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### SANITARY SECTION MEETING.

The next meeting of the Sanitary Section of the Boston Society of Civil Engineers will be held at the City Club on Wednesday, December 1st, at 7.30 o'clock. The subject of the meeting will be the Sterilization of Water and Sewage. Mr. George A. Johnson, consulting engineer, of the firm of Herring & Fuller, of New York, will lead the discussion on the Sterilization of Water, and Professor Earle B. Phelps of the Institute of Technology and of the firm of North & Phelps of New York, the discussion on the Sterilization of Sewage. Both of these gentlemen are pioneers in research work along these lines.

The meetings will be preceded by the usual dinner at the Boston City Club at 6.00 o'clock.

This meeting will afford the first opportunity for the residents of Boston and vicinity to listen to those who have had actual charge of the work which is causing so much interest and discussion in sanitary circles, especially those outside of New England.

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### INFORMAL MEETINGS.

The practice, which has proved acceptable in former years, of holding informal meetings in the Society's Library on Wednesday evenings not assigned to the regular meetings of the Society and the Sanitary Section will be continued this winter.

Members are requested to notify the Secretary of subjects which they think will be of interest to have presented. It is hoped that many of the members who have recently joined the Society will speak about matters which have come to their knowledge, even if but a short time would be needed in which to treat them as arrangements can be made to have a number of topics taken up in a single evening.

Meetings will be at 7.45 in the Society's Library, 715 Tremont Temple.

On Dec. 8, 1909, the first of these meetings will be held, at which a paper will be read prepared by Charles T. Main and F. M. Gunby entitled "The Cost of Power for Various Industries under Ordinary Conditions."

#### MEETING OF THE BOSTON SECTION, AMERICAN SOCIETY OF MECHANICAL ENGINEERS.

The next meeting of the Boston members of the American Society of Mechanical Engineers will be held at the Lowell Building, Mass. Institute of Technology, Wednesday evening, November 17, at 8 o'clock. The subject of this meeting will be a topical discussion on Low Pressure Steam Turbines. This discussion will be opened by Mr. H. G. Stott, Mr. W. L. R. Emmet, Mr. Richard H. Rice, Prof. Miller and others.

Members of the Boston Society of Civil Engineers are cordially invited to attend this meeting.

#### MEETING OF THE BOSTON SECTION, AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS.

A meeting of the Boston Section of American Institute of Electrical Engineers will be held Wednesday evening, November 17th, at 8.00 P. M. at the auditorium of the Edison Building, 39 Boylston street.

Dr. Bell will give a talk on "The Economics of Modern Lighting."

Members of the Boston Society of Civil Engineers are cordially invited to attend this meeting.

## CANDIDATES FOR MEMBERSHIP.

To be balloted on at meeting Nov. 17, 1909.

### AS MEMBERS.

WALTER CHALONER DUFFEE, Jamaica Plain, Mass. (b. 1883). Received A. B. at Harvard in 1904 and A. M. in 1905; continued at Harvard as Austin Teaching Fellow in Engineering until 1907; June to September, 1907, in tunnels of Pennsylvania and Long Island R. R., New York; from September, 1907, to present date, with Walworth Manufacturing Co. as experimental engineer. Recommended by Edmund S. Davis, G. D. Emerson, A. M. Mattice and L. J. Johnson.

CHARLES HENRY DUTTON, Waltham, Mass. (b. 1873). From 1891 to 1897, with Smith & Brooks of Lowell, Mass.; 1897 to 1901, at Lawrence Scientific School; 1901 to 1902, with Metropolitan Water and Sewerage Board; 1903 to 1906, with City of Manila, P. I.; three months in 1907 with American Bridge Co.; and September, 1907, to date, with J. R. Worcester & Co. Recommended by Melvin B. Smith, Ernest P. Whitten, Ira N. Hollis and Lewis J. Johnson.

HERBERT THURSTON GERRISH, Melrose, Mass. (b. 1886). Graduated from the Massachusetts Institute of Technology, 1908; summers of 1904 to 1907, and since graduation, with the Eastern Dredging Co., 247 Atlantic Avenue, Boston. Recommended by James W. Rollins, Jr., Frank W. Hodgdon, Frederic H. Fay and C. Frank Allen.

PHILIP HEDENBERG LADD, Medford, Mass. (b. 1885). Educated at High School, Medford, Mass., and attended University of Tucson, Arizona, for two years, taking the civil engineering course; worked on preliminary location and construction of survey for railroads in Arizona, New Mexico and Mexico, for the past four years, having been rodman, leveler, topographer and transit man on that work; at present employed as transit man on the Cambridge Subway construction. Recommended by W. T. Wiley, Ralph E. Rice, Frank H. Carter and George A. Kimball.

BERNARD SHAFFNER ROSE, Cambridge, Mass. (b. 1883). Rodman in City Engineer's office, Providence, R. I., June, 1902, to November, 1902; instrument man, inspector and chief of party for Mr. O. Perry Sarle, C. E., Providence, R. I., from April, 1903, to January, 1907; took special course in Brown University while with Mr. Sarle, from September, 1905, to January, 1907; detail draughtsman with Boston Bridge Works from January, 1907, to September, 1908; now employed by Boston and Albany R. R. as chief of party on the East Boston Pier Improvements. Recommended by J. B. Russell, J. C. Moses, H. M. Chadwick and F. P. Morrill.

WILLIAM THOMAS SHAW, Middleboro, Mass. (b. 1880). Received B. S. from Dartmouth in 1904 and C. E. from Thayer School of Civil Engi-

neering in 1906. From June to November, 1906, employed by Charles River Basin Commission; November, 1906, to December, 1908, with Cumberland Valley Railroad; since May as transitman for Boston Elevated Railway; and at present engaged on computation relating to Cambridge Main Street Subway. Recommended by George A. Kimball, Ralph W. Loud, Ralph E. Rice and Frank H. Carter.

GEORGE REED WADSWORTH, Brookline, Mass. (b. 1875). Graduated from Massachusetts Institute of Technology, 1898; June, 1898, to May, 1905, with New York Central & Hudson River R. R. as follows: June, 1898, to March, 1899, transitman; March to November, 1899, assistant supervisor of track; November, 1899, to February, 1901, assistant engineer, middle division, Albany, N. Y., in charge of yards and engine house lay-outs and bridge masonry and renewals, etc.; February to June, 1901, assistant to engineer of track, Grand Central Station, designing, etc.; June, 1901, to April, 1902, resident engineer, middle district, at Albany, in responsible charge of contract work, including sewer through Albany Basin, substructure renewal of freight bridge across Hudson River, passenger station at Troy, N. Y., and brick car-shops at West Albany; April, 1902, to February, 1903, designing engineer, Grand Central Station, in charge of designs and estimates; February, 1903, to February, 1905, assistant engineer on terminal improvements in New York City, in responsible charge on Port Morris Depression, including 500-ft. double-track rock tunnel, 1 500-ft. double-track concrete arch-roof subway, also Marble Hill Cut-off, and designs and schemes for four-tracking and re-alignment in Electrification Zone; February to May, 1905, resident engineer, Hudson district, in responsible charge of contract work on terminal improvements from Mott Haven to Croton-on-Hudson; May, 1905, to November, 1907, with J. G. White & Co., Inc., New York City, in construction department, on steam and electric railroad construction, irrigation projects, wharves, dams, etc.; December, 1907, to March, 1909, engineer for Metropolitan Improvements Commission of Massachusetts, on investigation and report on passenger and freight steam railroad systems, with allied water-front facilities within Metropolitan District of Boston and recommendations for joint development of properties; May, 1909, to date, engineer East Boston Co., Boston, in charge of preparation of plans and estimates for proposed docks, wharves, railroads, etc., along water front of East Boston. Recommended by Alfred E. Burton, C. H. Pease, H. L. Coburn and C. B. Breed.

JOHN MAURICE WISEMAN, Cambridge, Mass. (b. 1884). Graduate of Cambridge Latin School, class of 1903; attended Massachusetts Institute of Technology, 1903 to 1904; summer of 1905, Harvard Engineering camp; 1905 to 1907, with Bureau of Elevated and Subway Construction, 1907 at Lawrence Scientific School; and at present transitman with Bureau of Elevated and Subway Construction, Boston Elevated Railway, Cambridge Main Street Subway. Recommended by Ralph W. Loud, George A. Kimball, Frank H. Carter and Edward E. Albee.

## APPLICATIONS FOR MEMBERSHIP.

The following applications for membership have been received and are now before the Board of Government for approval. Members having information which will assist the government in its consideration of these applications are requested to communicate at once with any member of the Board. Communications will be regarded as confidential and for the use of the Board alone.

### AS MEMBERS.

HOWARD KEITH ALDEN, Wakefield, Mass. (b. 1882). Graduated from the Oneonta Normal School, 1902; from Harvard College, A. B., in 1906; graduate work in civil engineering for two and one-half years in the graduate school of Applied Science at Harvard. Began working for the B. & A. R. R. in March, 1909, as chairman, and as rodman in June. At present employed as rodman by the B. & A. R. R., located at Resident Engineer's office, East Boston. Recommended by J. B. Russell, E. A. Haskell, H. J. Hughes and L. J. Johnson.

WALTER HINDS ALLEN, Hingham, Mass. (b. 1875). Received B. A. 1895 and Ph. B. 1896, Yale University. October, 1898, to March, 1899, rodman N. Y. N. H. & H. R. R.; April, 1899, to December, 1900, rodman and instrument man, Guanecevi Extension, Mexican International R. R.; January to May, 1901, topographer and mapper, Kansas City, Mexico & Orient R. R.; June, 1901, to June 1903, rodman and assistant engineer, Hartford Division, N. Y. N. H. & H. R. R.; June, 1903 to date, civil engineer, U. S. Navy, stationed as follows: June, 1903, to March, 1906, New York Navy Yard; March, 1906, to July, 1909, Charleston, S. C., Navy Yard; July, 1909, to date, Naval Magazine, Hingham Mass. Recommended by D. C. Webb, H. R. Stanford, B. T. Wheeler and S. E. Thompson.

ELMER CLIFFORD HOUDLETTE, Somerville, Mass. (b. 1887). Attended the University of Maine; went to work as instrument man for the Boston Elevated Co., on the new Cambridge Subway on August 15th, 1909, and still in their employ as transitman on the Cambridge, Main Street Subway. Recommended by W. T. Wiley, E. E. Albee, F. H. Carter and G. A. Kimball.

CHARLES REED MAIN, Winchester, Mass. (b. 1885). Graduated from Dartmouth College, 1907, with degree of B. S., (the course of study including the first year's work at the Thayer School of Civil Engineering), and from the Massachusetts Institute of Technology in 1909, with the degree of S. B., in the department of Mechanical Engineering. At present with Charles T. Main, 45 Milk Street. Recommended by G. A. Nelson, R. A. Hale, F. W. Hodgdon and Peter Schwamb.

CHARLES REED MARSH, Boston, Mass. (b. 1883). Graduate of Philadelphia Central High School, 1903; entered civil engineering course of



Cornell University, September, 1903, left September, 1905; entered civil engineering course, University of Pennsylvania, left June, 1906. Assistant engineer, R. R. construction and surveys, June, 1906-1907; superintendent, concrete building, August, 1907—October, 1907; April, 1908, to present, assistant superintendent construction, Quartermaster's Department, War Department, U. S. A. Recommended by George F. Hobson, George Bowers, Arthur Bartlett and Henry M. McCue.

## MINUTES OF MEETING.

### OCTOBER MEETING OF THE SOCIETY.

BOSTON, OCT. 20, 1909. — A regular meeting of the Boston Society of Civil Engineers was held at Chipman Hall, Tremont Temple, at 7.40 o'clock, P.M., Vice Pres. Charles T. Main in the chair; one hundred and eighty members and visitors present, including members of the Boston Section of the American Society of Mechanical Engineers.

The record of the last meeting was read and approved.

Messrs. Theodore M. Beach, William H. Ellis, Jr., William F. Farley, Oren L. Goodridge, Edward R. Hyde, Daniel P. Kelley, John L. Mann, Stanley A. Miller, Charles W. Robinson, Conant W. Ruth, Harry F. Sawtelle and Charles E. F. Stetson were elected members of the Society.

The chair stated that he had the report of Mr. Frank S. Hart, the committee appointed to prepare a memoir of Mr. Arthur W. Hunking. As Mr. Hart was not present, on motion of Mr. Bryant, it was voted that the memoir of Mr. Hunking be accepted, that its reading be dispensed with and the Committee on Publications of the Board of Government be authorized to print same in the *Journal*.

The chair announced the death of William Parker, a member of the Society, which occurred on Sept. 30, 1909. On motion of Mr. Bryant, it was voted that the president appoint a committee to prepare a memoir of our late fellow member, William Parker, the same to be presented to the Society by title, for publication in the *Journal*. The President has appointed as this committee, Messrs. Walter Shepard, Herbert C. Keith and Edward A. Haskell.

In taking up the literary exercises of the evening, the Chairman (Mr. Charles T. Main) said in part, that it was expected that

Prof. Hollis who is chairman of the Boston branch of the American Society of Mechanical Engineers, would be here to preside at the literary exercises during the latter part of the evening, when the meeting will really be in part a meeting of the Society of Mechanical Engineers.

A few months ago the Boston Society of Civil Engineers appointed a committee to consider the advisability of establishing a mechanical section of the Boston Society. About the same time the American Society of Mechanical Engineers were discussing the advisability of starting a Boston branch of that society.

All of the members of the committee appointed by the Boston Society were members of the American Society of Mechanical Engineers, and naturally, the question of the advisability of starting a Boston branch of the American Society of Mechanical Engineers was turned over to that committee.

But the question arose as to which would be the greater benefit to the greater number of engineers, a mechanical section of the Boston Society, or a Boston branch of the American Society.

It appeared that the number of Mechanical Engineers who were members of the Boston Society of Civil Engineers was relatively small as compared with the number of Mechanical Engineers in the City of Boston, and with the number of Mechanical Engineers who were members of the American Society.

In view of this, it seemed to the committee that a Boston branch of the American Society would be of greater benefit to the Engineers in general than a mechanical section of the Boston Society. The committee, however, has refrained from making a final report to the Boston Society because they do not want to have too many societies, and think it advisable that there should be a concert of methods and that all effort should be concentrated, if possible, in one general Society.

The reason for this joint meeting of the Boston Society of Civil Engineers and the American Society of Mechanical Engineers is that we might see if there be some possible way in which these two bodies can work together.

Prof. Gaetano Lanza then read the paper of the evening which had been prepared by himself and Mr. Lawrence S. Smith, entitled, "Comparison of the Results Obtained by the Use of

### Three Theories of the Distribution of the Stresses in Reinforced Concrete Beams with the Experimental Results.

A general discussion followed the reading of the paper which was participated in by Messrs. Sanford E. Thompson, Desmond FitzGerald, Robert L. Read, C. M. Spofford, H. F. Bryant, G. F. Swain and R. R. Newman, of the Boston Society, and Fred. Sumner Hinds of the American Society of Mechanical Engineers. The Secretary also read a discussion prepared by Mr. J. R. Worcester, past President of the Boston Society of Civil Engineers.

Adjourned.

S. E. TINKHAM, *Secretary.*

## LIBRARY NOTES.

### RECENT ADDITIONS TO THE LIBRARY.

#### State Reports.

New Jersey, Annual Report State Board of Health, 1908.

New Jersey, Annual Report of State Geologist, 1908.

#### City and Town Reports.

Bangor, Me., Annual Report of Water Board, 1908-1909.

Holyoke, Mass., Annual Report of Water Commissioners, 1908.

Montclair, N. J., Annual Report of Board of Health, 1908.

New Orleans, La., Semi-Annual Report of Sewerage and Water Board, 1908.

New York, N. Y., Annual Report of Board of Water Supply 1907.

#### Miscellaneous.

National Board of Fire Underwriters, Reports on the following cities: Atlanta, Ga.; Birmingham, Ala.; Cincinnati, O.; Dayton, O.; Des Moines, Ia.; Memphis, Tenn.; Mobile, Ala.; New Orleans, La.; Norfolk, Va.; Peoria, Ill.; Pittsburg, Pa.; Rockford, Ill.; Schenectady, N. Y.

Concrete Construction for Home and Farm.

Concrete Construction for Highways.

Concrete Construction for Railroads.

(Above three books gift of Atlas Portland Cement Co.)

Concrete, Plain and Reinforced. F. W. Taylor and S. E. Thompson. New edition. (Gift of authors.)  
 Electrical Dictionary. E. J. Houston. New Edition.  
 American Steam and Hot Water Practice.  
 American Plumbing Practice.  
 Timbering and Mining. William H. Storms.  
 Concrete System. Frank B. Gilbreth. (Gift of author.)  
 Electrical Tables and Formulas. E. A. Merrill.  
 Electrical Illuminating Engineering. William E. Barrows.  
 Hydraulic Elevators. William Baxter, Jr.  
 Boston Electrical Hand Book.

FREDERIC I. WINSLOW, *Librarian.*

#### LIST OF MEMBERS.

##### ADDITIONS.

THEODORE M. BEACH	. . . . .	126 Bowles St., Springfield, Mass.
WILLIAM H. ELLIS, JR.	. . . . .	473 Meridian St., East Boston, Mass.
OREN GOODRIDGE	. . . . .	Houlton, Me.
EDWARD R. HYDE	. . . . .	38 Pinckney St., Somerville, Mass.
DANIEL P. KELLEY	. . . . .	715 Parker St., Roxbury, Mass.
CHARLES W. ROBINSON	. . . . .	64 Harbor View Ave., Winthrop, Mass.
HARRY F. SAWTELLE	. . . . .	2 Central Sq., Cambridge, Mass.
CHARLES E. T. STETSON	. . . . .	18 High St. Houlton, Me.

##### CHANGE OF ADDRESS.

W. B. HAMMOND	. . . . .	14 Arlington St., Boston, Mass.
HENRY V. MACKSEY	. . . . .	P. O. Box 1057, Kingston, N. Y.
WILLIAM V. POLLEYS	. . . . .	130 W. Munroe St., Jacksonville, Fla.
HERBERT L. RIPLEY	. . . . .	542 Washington Ave., West Haven, Conn.
SIDNEY SMITH	. . . . .	330 East Broadway, Louisville, Ky.
EDWIN A. TAYLOR	. . . . .	915 East Salmon St., Portland, Ore.
CHARLES H. UMSTEAD	. . . . .	U. S. Court House, Texarkana, Tex.
ALLEN VANRENSSELAER	Care Great Falls Water Power & Townsite Co., Great Falls, Mont.	
E. W. WIGGIN	Care Engr's Office. Central N. E. R. Co. Hartford, Conn.	
H. P. WILSON	. . . . .	34 Webster St., Allston, Mass.

## NEW ENGINEERING WORK.

(Under this head the Excursion Committee proposes to present each month a brief résumé of engineering work in progress in New England, as far as such information is readily obtainable. The assistance of members is desired, and items of interest will be gladly received. Such items are intended to include not only works of exceptional magnitude or containing novel features, but also engineering construction work of all kinds and all degrees of magnitude. Notes should be in the hands of the Committee not later than the 1st Wednesday of each month. The thanks of the Committee are due to the members who have furnished data for the Bulletin.—FRANK H. CARTER, Secretary, Excursion Committee, 147 Magazine Street, Cambridge, Mass.)

**Commonwealth of Massachusetts.**—**METROPOLITAN PARK COMMISSION.**—The work of improvement of Upper Mystic River and Alewife Brook has required the construction at Cradock Bridge, Medford, of a dam with automatic tide gates, sluice gates and a boat lock. All stationary structures are of reinforced concrete, the tide gates 10 feet x 10 feet are of wood, the sluice gates 8 feet x 8 feet are of metal, and the lock gates are of wood. This work has been completed. The widening, deepening and straightening of the channel of the Mystic River and the excavation of a new and much larger channel for Alewife Brook is in progress.

The construction of the drives along the Mystic River has required four bridges, two over Mystic River, one over Alewife Brook, and one for Boston & Maine Railroad over driveway. These bridges are of arch design and are built of reinforced concrete.

**METROPOLITAN WATER AND SEWERAGE.**—*Water Works.*—*Supply Pipe Lines.*—During the month of November work will be continued during favorable weather on the new 60-inch pipe line which is being laid to reinforce the existing 48-inch supply main which extends from the Charles River, Newton, to the Effluent Gate-House at the Chestnut Hill Reservoir in Brighton, for a distance of about 35,000 feet.

On November 1st about 5000 feet of pipe line remained to be laid to complete the section of 8000 linear feet which is now under contract. During the month pipe laying will be in progress in Chestnut Hill and Commonwealth Avenues in Brighton, and in the strip of land in Newton extending northwesterly from Commonwealth Avenue at the Newton-Boston boundary line and parallel with the Cochituate Aqueduct.



A 60-inch Venturi meter will be set in the line at the corner of Beacon Street and Chestnut Hill Avenue in Brighton early in the month.

*Northern High Service Pipe Lines.*—The new 24-inch northern high-service pipe line, which is being laid from Broadway at High Street in Everett to Broadway at Fenno Street in Revere, to reinforce the existing 20-inch main, has been completed through Fenno Street in Revere and Washington Avenue in Chelsea for a distance of 8000 feet, and work is now in progress in Nichols Street in Everett. The length of pipe remaining to be laid is 4300 feet.

**Boston Elevated Railway Company.**—ELEVATED AND SUBWAY CONSTRUCTION. — *Forest Hills Extension.*—The condition of the work at the Forest Hills Station is such that the station can be thrown open to traffic at any time. The extensive alterations at Dudley Street Station are well along on the west loop, and temporary arrangements on the east loop are being installed to accommodate the new conditions incident to the operation of trains to Forest Hills. The track work and signal system of the Extension are complete, so that there is no reasonable doubt but that trains for public traffic will be running to Forest Hills shortly after the middle of this month.

**CAMBRIDGE MAIN STREET SUBWAY.**—*Main Street and Massachusetts Avenue*—Work is progressing rapidly on reinforced concrete retaining walls of the Cambridge Bridge open incline, also on covered subway, part of which has been back filled. Cars have been turned off Main Street and work is being prosecuted along that street at several different points, pump wells for which are now complete. Water has been pumped from these pump wells for several weeks to lower the ground water preparatory to construction of the subway proper.

Metropolitan and City of Cambridge Sewer Siphon Crossing at Portland Street is under process of construction at the present time. Underground pipe structures are being replaced ahead of the subway construction. Metropolitan water pipe crossing at Prospect Street will be under way by the 15th of the month.

*Dana Hill Tunnel.*—Drift walls have been pushed toward Harvard Square 300 feet ahead of the shield and about 100 feet toward Central Square. The shield is riveted and in place and

will be in operation in about two weeks. Work is being pushed on the concrete mixing plant inside of the shaft.

*Harvard Square Station.*—The Cambridge Common incline concrete retaining walls of gravity type are practically complete and about 100 feet of double barreled reinforced concrete arched subway is partly back filled. Slice sections of the subway station are under way in front of College block, also three slice sections of surface car platform at Mt. Auburn Street approach. Part of the steel work is fabricated by the company at the Main Street yard. Different types of concrete mixing plants are under operation on the line of the subway and may be readily inspected by the members. Reinforced rods are bent by the company at the Main Street yard.

**HARBOR AND LAND COMMISSIONERS.**—Following work has recently been finished:—

Extending stone jetties at Vineyard Haven.

Building concrete sea-wall at Scituate.

Dredging in Annisquam River.

Dredging berth in Reserved Channel, South Boston Flats.

At the latter place, work is about to begin on the construction of a pile wharf, 300 feet by 50 feet

Following work is now in progress:—

Dredging channel at West Falmouth.

At Chatham, protecting shore with stone riprap.

At South Yarmouth, strengthening with stone riprap the jetties at mouth of Bass River.

At Wellfleet, building dike across Herring River.

Work is expected to begin shortly at the Commonwealth Pier, South Boston Flats, dredging to a depth of 35 feet at mean low water, for a dock 1,150 feet long, 150 feet wide and an area outside the pier about 500 feet by 600 feet.

The following proposed work has just been advertised:—

At Cuttyhunk, dredging 12 feet deep, a channel 2,200 feet long, 60 feet wide, and an anchorage basin 150 feet by 300 feet.

At Herring River, West Harwich, extension of stone jetties.

At Lynn Harbor, dredging to a depth of 6 feet an anchorage basin about 350 feet square, and a short channel 100 feet wide.

**Boston, Mass.**—Ground has been broken by Benj. Fox, Inc., for a concrete salesroom and garage for the Studebaker Co., on

Cumington Street in the Back Bay district. The contract covers the complete equipment of the building ready for occupancy. It is designed with a most pleasing architectural exterior suited to the material of which it is constructed and without any attempt to make it look like stone, brick, or any other material than concrete. It will be 170 feet by 51 feet, two stories and a finished basement in height. This building to be ready for occupancy by Jan. 1, 1910.

**Canton, Mass.**—Work on the concrete factory and Power House for the C. C. C. Fire Hose Co., has progressed to the first floor level, the pouring of which has just been commenced. This work is being pushed to an early completion. The main building is 127 feet x 52 feet, two stories, the Power House, 41 feet x 32 feet. Benj. Fox, Inc., have the contract for the work.

**East Boston, Mass.**—Work has recently been started on a 1400 feet retaining wall, 10 feet in height for the Standard Oil Co. of New York. This wall serves as a fire wall in case of an overflow of oil from the tanks which it surrounds.

Work will also be started at once on a brick and concrete Drying House and Blower House, 18 feet x 23 feet, one story in height for the same Company. Benj. Fox, Inc., are handling these contracts.

**East Cambridge, Mass.**—First Street, at the end of the West Boston Bridge. Interior finish is just going into the Carter's Ink Co's new reinforced concrete factory; Densmore & LeClear, Engineers; Aberthaw Construction Co., Builders; an unusually good example of clean concrete construction with unusually elaborate concrete front. The floors have been subjected to extremely heavy test loads without deflection; the whole building is unusually well planned and executed.

**East Somerville.**—*Dirty Marshes.*—Near the Sullivan Square Elevated Station, The Aberthaw Construction Co., is building the foundations for the Locomotive Shop of the new B. & M. Railroad repair shops. Heavy mat work on top of concrete piles, with reinforced concrete pits and reinforced concrete beam on top of concrete piles forming the foundation walls of the building.

**East Watertown, Mass.**—*Hood Rubber Company.*—Between Arsenal Street and the Watertown branch of the B. &

M. R. R., the Aberthaw Construction Co., is erecting the second of the reinforced concrete buildings which the Hood Rubber Company is erecting for additions to the manufacturing plant; Henry F. Bryant, engineer. The buildings are located on a spur track with concrete unloading platforms the height of car body. Both buildings are of reinforced concrete construction throughout. One is two stories with provision for two stories' additional height; the other is a one-story flat slab mushroom construction with provision for carrying three additional floors. Concrete is now going into place. An accessible place to see the different types of concrete construction.

**Natick, Mass.**—The reinforced concrete storage building for the Natick Box Co., has just been completed. The curtain walls are of 6 inch vitrified tile. The building is 200 feet x 60 feet and two stories in height, and was constructed by Benj. Fox, Inc.

**New Bedford, Mass.**—Benj. Fox, Inc., are constructing a 400 foot concrete retaining and fire wall 10 feet in height for the Standard Oil Co. of New York. The work on same is now more than half completed.

**New Haven, Conn.**—For the Winchester Repeating Arms Co., the Aberthaw Construction Co. are reinforcing a cracked concrete chimney with the chimney in use. The chimney was originally built of dry concrete with so little stone in it that it practically amounted to mortar. Large cracks appeared in the first year and pieces of the surface showed rotten so that they would split away from the steel with a light touch. So that the concrete might not be injured by the heat of the gases, the old chimney is swathed with asbestos paper. Around this is built a concrete shell with vertical and horizontal steel. The method of handling is by metal forms which clamp around the chimney. These can be loosened, drawn up by tackles attached to a collar at the top of the chimney, filled with concrete, and again moved forward. The contractors are moving the forms up at a rate of about five feet per day.

The same Company is just completing two 300-foot factory buildings of reinforced concrete with brick panel exterior walls for the Winchester Repeating Arms Co.



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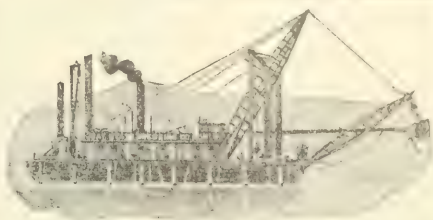
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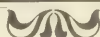
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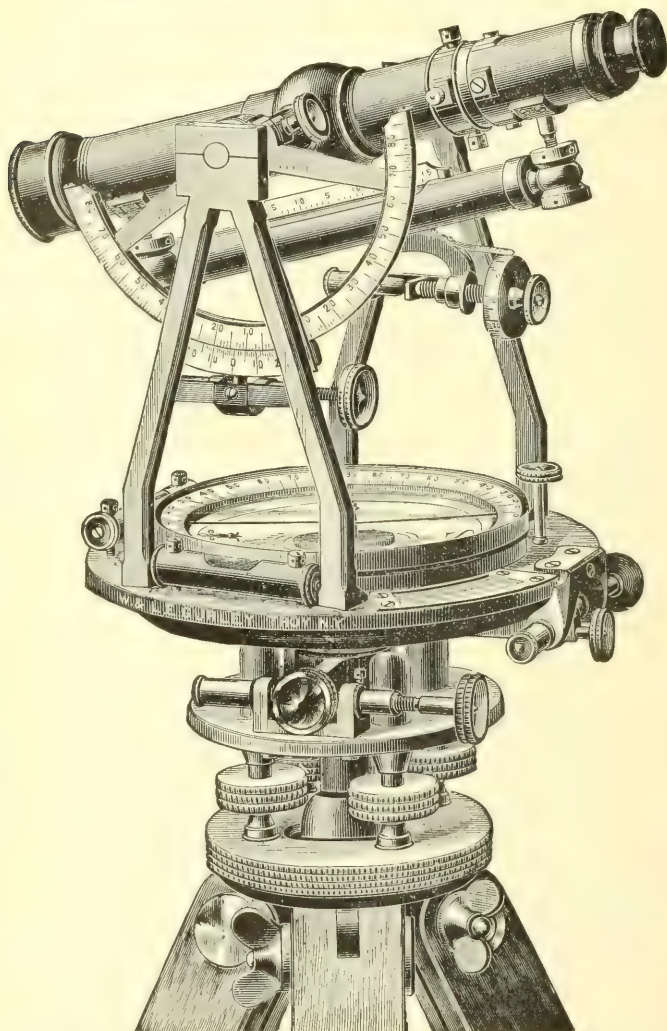
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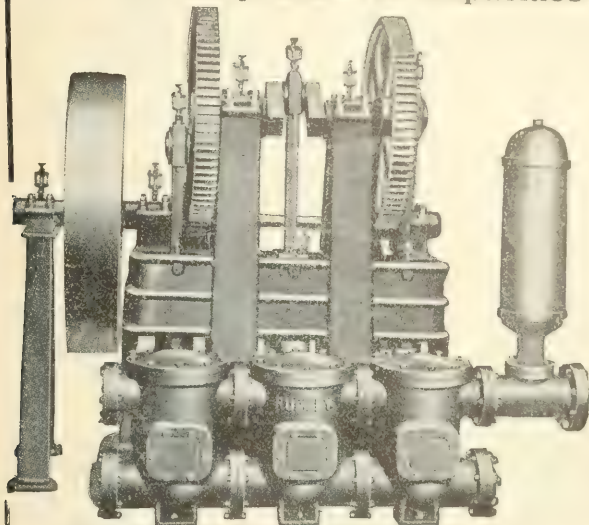
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**BOSTON SOCIETY OF CIVIL ENGINEERS.**

**ORGANIZED JULY 3, 1848.**

# MONTHLY BULLETIN.

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NEW SERIES.

DECEMBER, 1909.

No. 37

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## REGULAR MEETING.

A regular meeting of the Boston Society of Civil Engineers will be held on Wednesday, December 15, 1909, at 7.30 p. m., in  
CHIPMAN HALL, TREMONT TEMPLE, BOSTON.

**BUSINESS OF THE MEETING:** To ballot on the applications for membership as announced in this notice.

The following papers will be read:

"An Account of the Tyng's Island Suspension Bridge, near Lowell, Mass.," by James W. Thomas of the Westinghouse, Church, Kerr Co.

"The Bellows Falls Arch Bridge," by J. R. Worcester.

"The Old Chain Bridge at Newburyport," by R. R. Evans and George F. Swain.

The lantern will be used for illustrations of the papers.

S. E. TINKHAM, *Secretary.*

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## EXCURSION, DECEMBER 15, 1909.

The Coffin Valve Company of Neponset has extended an invitation to the members of the Society to visit their plant on Wednesday afternoon, Dec. 15, 1909. The party will meet at the South Station, in time to take the train for Popes Hill, at 2.16 p. m. Members will spend about two hours at the works, leaving by trolley or by the 4.29 p. m. train for the South Station.

The Coffin Valve Company specializes in the manufacture of large sluice and gate valves, also fire hydrants, and water works appliances; and is well equipped to manufacture valves of massive proportions.

The plant is located at Neponset, Mass., on the Old Colony Division of the New York, New Haven & Hartford Railroad. The Company employs ordinarily about one hundred and fifty men, all engaged in the manufacture of valves and allied operating appliances. During the past twenty years the Company has been identified with the largest enterprises of this country; the following contracts indicating the magnitude of the work turned out:—

For Cincinnati, O.: Approximately thirty 5-foot diameter gate valves; for the Rio de Janeiro Tramway Light & Power Company: Two 8-foot gate valves, four 9-foot x 8-foot rectangular sluice gates and two 9-foot x 12-foot rectangular sluice gates; for the City of Chicago: Ten 8-foot circular sluice gates, two 12½-foot double face sluice gates; for the United States Government: five 8-foot x 12-foot rectangular sluice gates; for the City of Boston, Mass.: four 8-foot x 12-foot rectangular sluice gates.

They are now building at their factory three 6-foot gate valves and three 7-foot gate valves for the Mexican Light & Power Company; also for the United States Government, one 6-foot and two 5-foot gate valves. All of the gates last mentioned, with the exception of one 7-foot, are electrically operated, this one being operated by a hydraulic cylinder, brass lined, 51 inches inside diameter.

The Company has made a special study of the application of electric motors to their large valves, and in many instances the massive valves furnished by them during the past few years have been installed with electric equipment.

While shipments are being made each week of this large work, it is expected the engineers will be able to see at least one 6-foot gate valve assembled and operating; also a number of castings in process of construction.

## EXCURSION COMMITTEE.

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### JANUARY EXCURSION.—Preliminary Notice.

The officials of the Boston Elevated Railway Company and the contractor for the Cambridge Main Street subway have extended an invitation to the members of the Boston Society of Civil Engineers to visit the work in progress on the Cambridge Main

Street subway on the afternoon of Jan. 26, 1910. The excursion will be carried out rain or shine as much of the work is under cover. The contractor plans to furnish entertainment for the party in the subway. For a description of the work members are referred to the news item in this *Bulletin*. Further details regarding the excursion will be announced in the January *Bulletin*.

## EXCURSION COMMITTEE.

### CANDIDATES FOR MEMBERSHIP.

To be balloted on at meeting Dec. 15, 1909.

#### AS MEMBERS.

HOWARD KEITH ALDEN, Wakefield, Mass. (b. 1882). Graduated from the Oneonta Normal School, 1902; from Harvard College, A. B., in 1906; graduate work in civil engineering for two and one-half years in the graduate school of Applied Science at Harvard. Began working for the B. & A. R. R. in March, 1909, as chainman, and as rodman in June. At present employed as rodman by the B. & A. R. R., located at Resident Engineer's office, East Boston. Recommended by J. B. Russell, E. A. Haskell, H. J. Hughes and L. J. Johnson.

WALTER HINDS ALLEN, Hingham, Mass. (b. 1875). Received B. A. 1895 and Ph. B. 1896, Yale University. October, 1898, to March, 1899, rodman N. Y. N. H. & H. R. R.; April, 1899, to December, 1900, rodman and instrument man, Guanecevi Extension, Mexican International R. R.; January to May, 1901, topographer and mapper, Kansas City, Mexico & Orient R. R.; June, 1901, to June 1903, rodman and assistant engineer, Hartford Division, N. Y., N. H. & H. R. R.; June, 1903 to date, civil engineer, U. S. Navy, stationed as follows: June, 1903, to March, 1906, New York Navy Yard; March, 1906, to July, 1909, Charleston, S. C., Navy Yard; July, 1909, to date, Naval Magazine, Hingham Mass. Recommended by D. C. Webb, H. R. Stanford, B. T. Wheeler and S. E. Thompson.

ELMER CLIFFORD HOUDLETTE, Somerville, Mass. (b. 1887). Attended the University of Maine; went to work as instrument man for the Boston Elevated Co., on the new Cambridge Subway on August 15th, 1909, and still in their employ as transitman on the Cambridge, Main Street Subway. Recommended by W. T. Wiley, E. E. Albee, F. H. Carter and G. A. Kimball.

CHARLES REED MAIN, Winchester, Mass. (b. 1885). Graduated from Dartmouth College, 1907, with degree of B. S., the course of study including the first year's work at the Thayer School of Civil Engineering.



and from the Massachusetts Institute of Technology in 1909, with the degree of S. B., in the department of Mechanical Engineering. At present with Charles T. Main, 45 Milk Street. Recommended by G. A. Nelson, R. A. Hale, F. W. Hodgdon and Peter Schwamb.

CHARLES REED MARSH, Boston, Mass. (b. 1883). Graduate of Philadelphia Central High School, 1903; entered civil engineering course of Cornell University, September, 1903, left September, 1905; entered civil engineering course, University of Pennsylvania, left June, 1906. Assistant engineer, R. R. construction and surveys, June, 1906-1907; superintendent, concrete building, August, 1907-October, 1907; April, 1908, to present, assistant superintendent construction, Quartermaster's Department, War Department, U. S. A. Recommended by George F. Hobson, George Bowers, Arthur Bartlett and Henry M. McCue.

#### AS AN ASSOCIATE.

EDWARD EVERETT SAVORY, Newtonville, Mass. (b. 1878). Studied mechanical engineering at Harvard University and afterwards at home while in the employ of Harvard University under Prof. W. S. Burke; have studied concrete, both plain and reinforced; at present employed in the Portland Cement business. Recommended by J. R. Worcester, E. E. Pettee, Arthur W. Hodges and Chester J. Hogue.

### COMING REGULAR MEETINGS.

The following preliminary announcement is made of papers to be read at early regular meetings of the Society:—

JANUARY 26, 1910.—“Hydraulic Power Development with special reference to Ambursen Dam Construction,” by W. L. Church.

FEBRUARY 16, 1910.—“Talk on the Panama Canal,” illustrated by lantern slides, by H. K. Higgins.

### SANITARY SECTION MEETING.

The next meeting of the Sanitary Section of the Boston Society of Civil Engineers will be held on Jan. 12, 1910, at the Boston City Club at the usual hour. The subject of the meeting will be the design and construction of trickling filters. The principal speakers will be Mr. William Gavin Taylor, now with the Passaic Valley Commission, and until quite recently connected with the City Engineer's Department of Waterbury, Conn.; Mr. Taylor

has also contributed quite largely to the engineering literature and has designed a well-known type of sewage sprinkler. It is also hoped that Mr. O. M. Weand, the contractor for the Reading, Pa., sewage filters, and the maker of the sewage sprinklers used there, will also present a paper.

### INFORMAL MEETINGS.

The practice, which has proved acceptable in former years, of holding informal meetings in the Society's Library on Wednesday evenings not assigned to the regular meetings of the Society and the Sanitary Section will be continued this winter.

Members are requested to notify the Secretary of subjects which they think will be of interest to have presented.

Arrangements have been made to use at these meetings an opaque lantern which will enable the talks to be illustrated from original photographs, cuts or post cards, not exceeding five inches square, and thus avoid the expense and delay of preparing slides.

Meetings will be held at 7.45 in the Society's Library, 715 Tremont Temple.

On Jan. 5, 1910, Mr. Edwin J. Beugler will give a talk entitled, "The Analysis of Water Power Propositions."

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### MEETING OF THE BOSTON SECTION, AMERICAN SOCIETY OF MECHANICAL ENGINEERS.

The next meeting of the Boston members of the American Society of Mechanical Engineers will be held in the library of the Edison Electric Illuminating Co., No. 39 Boylston Street, Friday evening, December 17th, at 8 o'clock.

Prof. I. N. Hollis, Prof. Edw. F. Miller and Mr. A. S. Mann of Schenectady will each read short papers on the subject of the Use of Cast Iron for Fittings in Superheated Steam Lines. Mr. John Primrose, Engineer of the Power Specialty Co., and some others will present discussions on this paper.

Members of the Boston Society of Civil Engineers are cordially invited to attend this meeting.

## THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

The Engineering Section (D) of the American Association for the Advancement of Science will hold its meetings in Room 31, Engineering Building A, Trinity Place, Boston, on Dec. 29 and 30, 1909. Prof. G. F. Swain, retiring chairman of the Section and vice-president of the Association, will deliver his address at 2.30 p. m. on Wednesday, December 29th, subject: "The Profession of Engineering and Its Relation to the American Association for the Advancement of Science."

Other papers have been definitely promised as follows:

The Relation of Wind to Aeronautics, by A. L. Rotch.

The Present Status of Aerial Navigation, by O. Chanute.

Wind Pressure and Velocity, by S. P. Ferguson.

Shifting of Wind with Altitude, by A. J. Henry.

Aerodynamics, by A. M. Herring.

Albert Zahm, Alexander Graham Bell and others will probably contribute papers or discussions on aeronautical subjects.

The Development of the Modern Textile Mill, by C. J. H. Woodbury.

Music Roll Cutters, by J. F. Kelly.

Parallel Rules, by H. E. Wetherill.

The Photographic Lens as an Engineering Implement, by E. H. Berry.

Other interesting papers, for which titles can not yet be announced, will be on the program. The dates and hour of presentation of each paper will be announced in the Official Program of the Association which will be obtainable at the office of the Permanent Secretary, Technology Union, Trinity Place, on Monday, December 27th.

The Secretary of the Section has extended a cordial invitation to members of this Society to attend the meetings of the Engineering Section.

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### SOCIETY OF ARTS MEETING.

Through the courtesy of the Secretary of the Society of Arts announcement is made of the next meeting of that Society:—

Dec. 16, 1909. Prof. William H. Pickering of Harvard College Observatory will speak on "The Moon as a Living Planet." The address will be illustrated by lantern slides.

The meetings of the Society are held at 8 o'clock, in Huntington Hall, Massachusetts Institute of Technology. All interested in the subjects are invited to attend.

## MINUTES OF MEETINGS.

### NOVEMBER MEETING OF THE SOCIETY.

Boston, Nov. 17, 1909. — A regular meeting of the Boston Society of Civil Engineers was held at Chipman Hall, Tremont Temple, at 7.45 o'clock, P.M., Pres. George B. Francis in the chair: eighty-one members and visitors present.

The record of the last meeting was read and approved.

Messrs. Walter C. Durfee, Charles H. Dutton, Herbert T. Gerrish, Philip H. Ladd, Bernard S. Rose, William T. Shaw, George R. Wadsworth and John H. Wiseman were elected members of the Society.

The secretary presented the report of the committee appointed to prepare a memoir of our late associate, Edwin W. Ellis, and on motion it was voted to accept the report and order it to be printed in the *Journal*.

The first paper of the evening entitled "Waterproofing of Engineering Structures," by Joseph H. O'Brien, was read by its author and was very fully illustrated by lantern slides. A discussion followed by the President and Messrs. Skinner, Hodgdon and Larned of the Society, and by Mr. Edward W. DeKnight of New York.

The second paper was by Gilbert S. Vickery, entitled "The Use of Manard Steel in Railroad Track." The paper was also illustrated by lantern slides. A general discussion followed the reading of the paper and at its conclusion the Society adjourned.

S. E. TINKHAM, *Secretary*.

### DECEMBER MEETING OF THE SANITARY SECTION.

The December meeting of the Sanitary Section was held at the Boston City Club on Wednesday evening, December 1st.

Mr. Ralph J. Sherriif was elected a member of the Section.

Prof. Earle B. Phelps read a paper on disinfection of sewage by means of chemicals, especially calcium hypochlorite, and Mr. George A. Johnson read a companion paper on the disinfection of water by similar means. The paper was discussed by Messrs. Kinnicutt, Winslow, Gage, Clark, Pratt and others. Sixty-nine members and guests were present.

ROBERT SPURR WESTON, *Clerk.*

## LIBRARY NOTES.

### BOOK REVIEW.

*Concrete Plain and Reinforced.* By Frederick W. Taylor and Sanford E. Thompson. Second Edition, 1909. pp. 807. \$5.00. John Wiley & Sons, New York.

[Donated by the author.]

In the second edition of this work the authors have added more than 200 pages to their first edition and have made radical changes in the substance and form of other portions, with a view of bringing the subject fully up to date. By using a thinner paper, however, they have succeeded in keeping the dimensions if not the specific gravity of the volume about the same.

The additional matter is largely devoted to a thorough explanation of methods of design of reinforced concretes, thereby rounding out a rather unsatisfactory treatment of this portion of of the subject in the first edition.

Great attention is paid to the arrangement of matter so as to facilitate reference to any particular subject. The use of bold faced type for paragraph headings, with smaller type for less important illustrations and examples, and placing of more abstruse calculations and studies in appendices, and the collection of essential principles and data at the beginning of the book are conspicuous evidences of this aim on the part of the authors.

The book is exhaustive in its treatment of the materials entering into concrete, the first ten chapters being devoted to this part of the subject. Chapter XI by Wm. B. Fuller gives a full consideration to the subject of proportioning. Chapter XII gives tables of quantities of materials in concrete and mortars. Chapters XIII to XIX cover the subjects of mixing, laying, effect of sea water, fire and rust protection and water tightness in a very com-



prehensive and satisfactory manner. Chapter XX deals with the strength of plain concrete, and Chapter XXI with the design of reinforced concrete. Chapter XXII is an entirely new one by Professor McKibben on the subject of concrete arches. Chapters XXIII to XXIX are devoted to uses of concrete in various forms. Chapter XXX gives a detailed description of the processes of manufacture of cement. The final chapter gives an enlarged bibliography covering the subject.

Throughout the work credit is given by copious foot notes to the authorities from which information has been obtained. In fact, it seems as if the authors had erred on the side of giving too much rather than too little credit to others.

The book will undoubtedly be recognized as a valuable reference book by all who are seeking complete information in any branch of the subject. The aim of the authors to make it available as a handbook for superficial users, notwithstanding the large number of convenient diagrams, tables, rules, specifications, etc., may possibly be somewhat defeated by the very fact of its comprehensiveness. The field is so broad that it is impossible to cover it fully without making a volume somewhat unwieldy, and the authors have evidently considered this of less importance than the risk of omitting anything of value.

JOSEPH R. WORCESTER.

#### RECENT ADDITIONS TO THE LIBRARY.

##### **City and Town Reports.**

Boston, Mass., Report of Finance Commission, Vol. IV.

Detroit, Mich., Annual Report of Department of Parks and Boulevards, 1909.

Philadelphia, Pa., Annual Report of Department of Public Works, 1908.

Syracuse, N. Y., Annual Report of Intercepting Sewer Board, 1908.

##### **Miscellaneous.**

Proceedings of Master Car Builders' Association, 1909.

Life and Work of Cyrus H. McCormick, by Herbert N. Casson. Gift of A. C. McClurg & Co.

FREDERIC I. WINSLOW, *Librarian.*

## LIST OF MEMBERS.

## ADDITIONS.

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HERBERT T. GERRISH . . . . .	247 Atlantic Ave., Boston, Mass.
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WILLIAM T. SHAW . . . . .	9 Ashburton Place, Boston, Mass.
RALPH J. SHERIFF (Sanitary Section)	16 Fairfield Ave., W. Medford, Mass.
GEORGE R. WADSWORTH . . . . .	19 Congress St., Boston, Mass.
JOHN M. WISEMAN . . . . .	17 Pemberton St., Cambridge, Mass.

## CHANGES OF ADDRESS.

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## DEATHS.

EARLE H. GOWING . . . . .	Died Nov. 24, 1909
LAURENCE BRADFORD . . . . .	Died Dec. 6, 1909

## NEW ENGINEERING WORK.

(Under this head the Excursion Committee proposes to present each month a brief résumé of engineering work in progress in New England, as far as such information is readily obtainable. The assistance of members is desired, and items of interest will be gladly received. Such items are intended to include not only works of exceptional magnitude or containing novel features, but also engineering construction work of all kinds and all degrees of magnitude. Notes should be in the hands of the Committee not later than the 1st Wednesday of each month. The thanks of the Committee are due to the members who have furnished data for the Bulletin.—FRANK H. CARTER, Secretary, Excursion Committee, 147 Magazine Street, Cambridge, Mass.)

**Commonwealth of Massachusetts.**—**METROPOLITAN WATER AND SEWERAGE.**—*Water Works.*—*Supply Pipe Lines.*—Work on the 60-inch supply pipe line which is being laid to reinforce the existing 48-inch main which extends from the Charles River, Newton, to the Effluent Gate-House at the Chestnut Hill Reservoir in Brighton, and on the new 24-inch northern high-service pipe-line which is being laid from Broadway at High Street in Everett to Broadway at Fenno Street, Revere, to reinforce the existing 20-inch main, described in the last *Monthly Bulletin* of the Boston Society of Civil Engineers, will be in progress until about the middle of December. At this date it is expected that the 24-inch main will be completed, and work on the 60-inch supply main will be suspended for the winter.

**METROPOLITAN PARK COMMISSION.**—*Alewife Brook Purification.*—Work of excavating new channel for Alewife Brook.

Work of construction of concrete retaining walls between Broadway and Massachusetts Avenue.

*Mystic River Reservation.*—Grading, surfacing and other work for drives along Mystic River from High Street to Main Street.

**CHARLES RIVER BASIN COMMISSION.**—*Work in Progress at the Dam and Lock.*—The roadway is being paved, and the Boston Elevated Railway tracks are being laid. It is expected to turn traffic over the Dam about the first of the year.

The work on the embankment is finished for the season. Dredging is still in progress at Watertown.

**HIGHWAY COMMISSION.**—State highways are under construction at the present time in the following cities and towns:—

Barnstable,  
Charlton,  
Chilmark,  
Hamilton,  
Hatfield,  
Haverhill,

Montague,  
Rochester,  
Somerset,  
Southboro,  
Stockbridge,  
Wareham,

Oil surfacing work is being completed at Leicester.

Bridges are under construction in the towns of Athol, Palmer and Newbury.

**HARBOR AND LAND COMMISSIONERS.**—The work of building a pile wharf on the northerly side of the Reserved Channel, South Boston Flats, is in progress.

The contract has been let for dredging to the depth of 35 feet at mean low water the berth on the easterly side of Commonwealth Pier. It is expected that the work will be commenced within a short time.

The building of a dike in Herring River, Wellfleet, is well advanced towards completion. The only work remaining to be done is the completion of the stone riprap facing on the outer face and the marsh sod facing of the inner side of the dike; also the completion of the surfacing of the roadway.

The riprapping of the bluff at Watch Hill in the town of Chatham with granite quarry grout as riprap has been practically completed. All the stone has been delivered, and only a small amount remains to be placed.

The strengthening with granite chips of the timber jetties at Bass River, South Yarmouth, is progressing rapidly.

The work of dredging a channel in Plymouth Harbor is still in progress, but will probably be discontinued for the winter some time during the month of December.

Contracts have been let for building up and extending the stone jetties at the mouth of Herring River, West Harwich; for dredging a channel and anchorage basin in Lynn Harbor, and another at Cuttyhunk Harbor, the work in each case to be completed during the coming summer.

**Boston Elevated Railway Company.**—**CAMBRIDGE MAIN STREET SUBWAY.**—*Main Street and Kendal Square Station.*—Work is being pushed with all possible speed along Main Street. Several different cable ways have been erected occupying practically the whole length of Main Street, about 3000 feet. About one thousand feet of open incline and double track subway are complete. Work is in progress on several sections of reinforced concrete arch and flat roof double track sections of subway. Excavation has been started for Kendal Square Station. The subway crossing under the B. & A. R. R. is under way. A sewer

siphon for the City of Cambridge sewer and the Metropolitan sewer is in process of construction.

*Dana Hill Tunnel.*—The shield was put in operation Nov. 15 and has been moved 75 feet toward Harvard Square, and the same length of concrete arch completed. Work in the drifts has been suspended until the shield will have proceeded to within 125 feet of the drift headings. The concrete is being mixed by hand on the surface; the mixing plant in the shaft will be in operation about December 15th.

*Harvard Square Station.*—Work is in progress in Harvard Square at seven or eight different points. The Cambridge Common open incline is practically complete, and some 200 feet of double barrelled reinforced concrete subway is back filled. The Mount Auburn Street open incline retaining walls are now under construction.

It is expected that the work on the subway will be in an interesting state for inspection by the members about the middle of January when it is expected that arrangements will be made for an excursion to the work.

ELEVATED AND SUBWAY CONSTRUCTION.—*Forest Hills Extension.*—The Forest Hills Extension, which was opened for public traffic on November 22nd, is a continuation of the present double-track elevated structure southerly over Washington Street, from Guild Street, Roxbury, to a point about 400 feet south of Forest Hills Square in West Roxbury. Plate longitudinal and cross girders are used throughout, the columns being standard Boston Elevated type, consisting of four angles and plate and two channels, the latter rolled with round corners. The first section of steelwork, about 80%, was fabricated and erected by the Fort Pitt Bridge Works, the last steelwork having been erected in January, 1907, to a point about 400 feet north of the Arborway. Owing to the delay in securing a location for the Forest Hills Station, the second section, or about 20%, was not erected until the latter part of 1908. This work, as well as the steelwork for the Forest Hills Station, was fabricated by the American Bridge Company at its Edgemoor plant.

The distance from the Dudley Street Station to Forest Hills is about  $2\frac{1}{2}$  miles, there being one station midway, at Egleston Square. The steelwork for this station was fabricated and erected



by the New England Structural Company. The ornamental iron work was made by the G. W. & F. Smith Iron Company for both the Eggleston Square and Forest Hills Stations. These stations have side track platforms of reinforced concrete.

Perhaps the most interesting feature of the Extension is the structure over the Arborway which is essentially a one-post double-track elevated structure, steelwork being covered with concrete, with a reinforced concrete track floor, two 3-foot side-walks and balustrades. A detailed description of the construction of the Arborway structure, as well as the Forest Hills Station, was given in the June, 1909, number of the *Monthly Bulletin* under the head of New Engineering Work.

**Portland, Me.**—The subject of flat slab mushroom floor construction—that is, concrete floors supported at the corners of bays on columns having spreading tops with slab built without beams—is receiving attention enough to make the accompanying cuts interesting as typical of the possibilities of this type of construction.

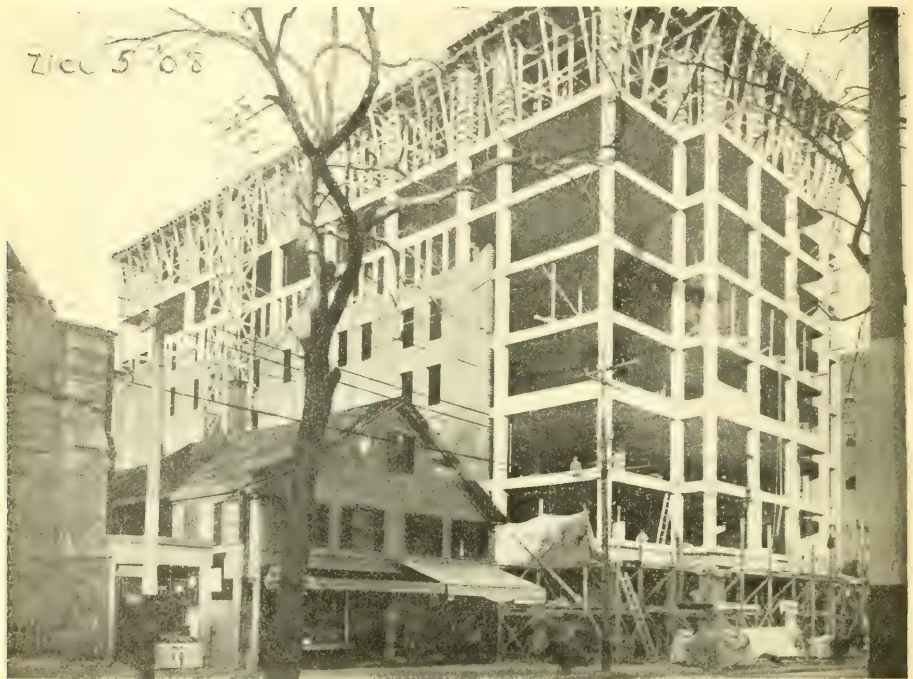


The advantages claimed for these floors are the saving of head-room and accordingly decrease in height of a building; also the flat ceiling which on office buildings allows plastering directly on the under side of the construction, and in mill buildings allows the spacing of sprinklers at their maximum distance and gives uninterrupted access for light at the top of the rooms. Incidentally, it has the advantage of giving an uninterrupted flow for a fire stream of water held at the full height of a given room. In practice the construction has proved economical, exceedingly rapid and very strong.

The particular work shown in the cuts is the Congress Block, opposite the Lafayette Hotel, Congress Street, Portland, Me. The extreme rapidity of this construction is well illustrated by the fact that the first picture was taken October 1st, showing the first floor steel and centering in place and part of the concrete run; while the next picture showing the brick walls partly up was taken on December 5th. The Construction Company built at a better rate than a story a week, and in one instance put in two stories in eleven days. The cost of the whole structure was a considerable economy on the cost of steel frame construction. The work was built by the Alberthaw Construction Co. of Boston according to plans by Frederic A. Thompson, Architect, of Portland. The size of the building is 80 x 180, the spacing of columns in general 18 x 20 feet; the floor slabs had a total thick-



ness of 7 inches. During construction, the builders used the first floor for storing their material. Teams were driven directly on to this and their loads dumped haphazard. No injury resulted and under extreme load there was but slight deflection. The organization and equipment which permitted the rapid handling of this work is fully described in the *Engineering Record* of April 10, 1909.



The Aberthaw Construction Co. has built two loading buildings for the Winchester Repeating Arms Co. under this same type of construction except steel columns are used instead of concrete; and is at present building a large addition to the Pierce Arrow Motor Car Co.'s plant at Buffalo, using the same Turner mushroom system.

C. A. P. Turner of Minneapolis claims patents covering this type of construction. A list of the claims which have been allowed him by the Patent Office may be seen at the office of the Aberthaw Construction Co., 8 Beacon Street, Boston, Mass.

**Portsmouth, N. H.**—*Coal Pockets for Portsmouth Coal Co.*—Capacity 10,000 tons. The foundation work is particularly difficult on account of having to go to bed rock, a depth of twenty feet through filling and below a swiftly running tide. Superstructure is the same as ordinary concrete pockets except that the bottom was designed with semi-circular arches supported on piers and beams. Conveyors and outriggers are built of reinforced concrete. The work has been done by the Eastern Concrete Construction Co., and is practically completed, Mr. Adolph Suck, Engineer.

**Allston, Mass.**—Coal pockets for the Massachusetts Wharf Coal Co. are of same construction as Portsmouth except that foundations were no more difficult than ordinarily encountered. The work is now about half completed, and is being done by the same contractor and from design by the same engineer as at Portsmouth.

**Lowell and Lynn, Mass.**—The Eastern Concrete Construction Co. are building an addition to the Lynn Storage Warehouse, 138 feet x 45 feet and six stories. The work is practically completed. This same company is also building a reinforced concrete warehouse for the Lowell Storage Warehouse, 100 feet by 145 feet, eight stories and basement. The foundations are now being put in.

**Charlestown, Mass.**—The Eastern Concrete Construction Co. are building for Lawrence & Wiggin, a wool warehouse, 360 feet by 80 feet, eight stories and basement; reinforced concrete floors, mushroom system and brick bearing walls. The work is practically completed.

**Concord, Mass.**—The famous Minute Man Bridge has been replaced by a handsome reinforced concrete structure, J. R. Worcester & Co., Engineers, and Eastern Concrete Construction Co., Contractors.

**Quincy, Mass.**—About twenty-four granite columns, twenty-six feet in length and about four and one-half feet in diameter, are being turned at the Granite Turning Works of Robert Cantley at West Quincy. These are the largest columns ever turned in a lathe in this vicinity. The work will not be finished for several weeks. Mr. Cantley's works are on the line of the Quincy quarry railroad, about a mile from the West Quincy Station.



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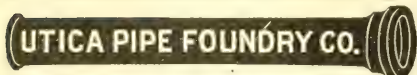
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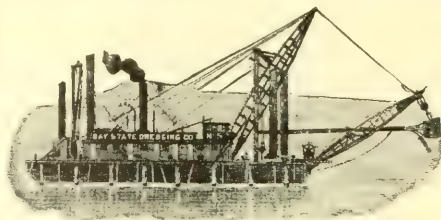
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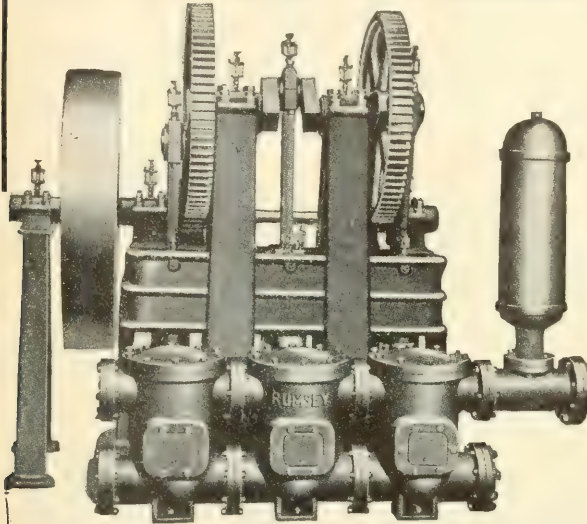
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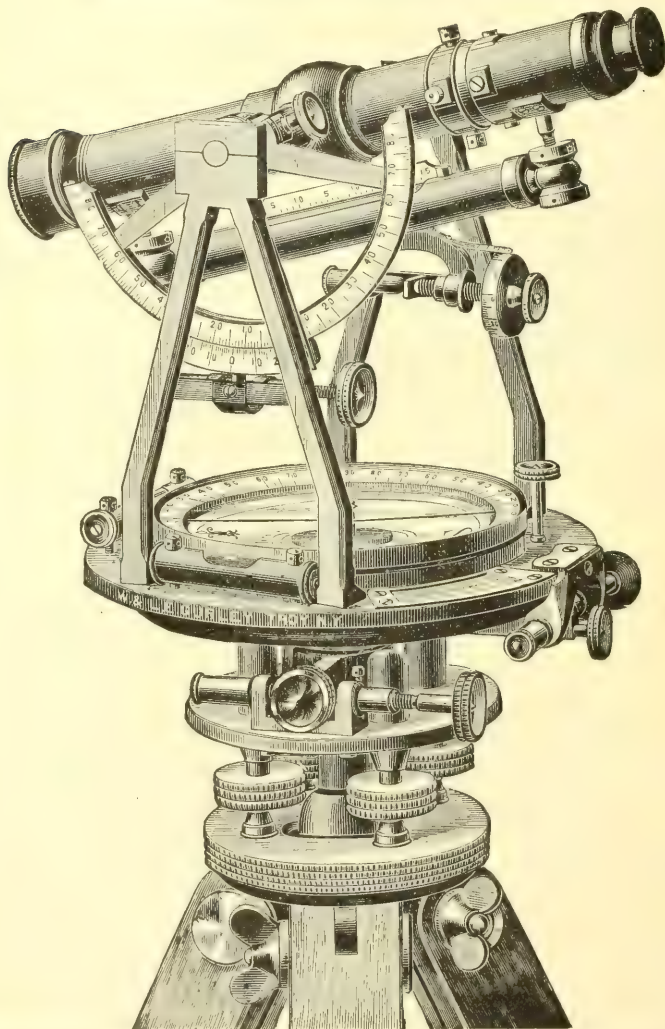
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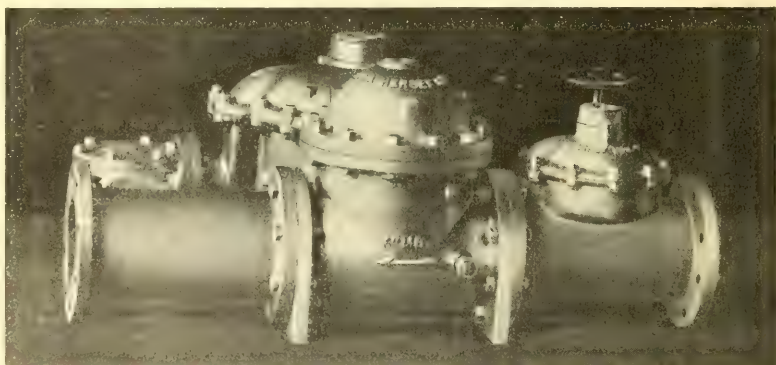
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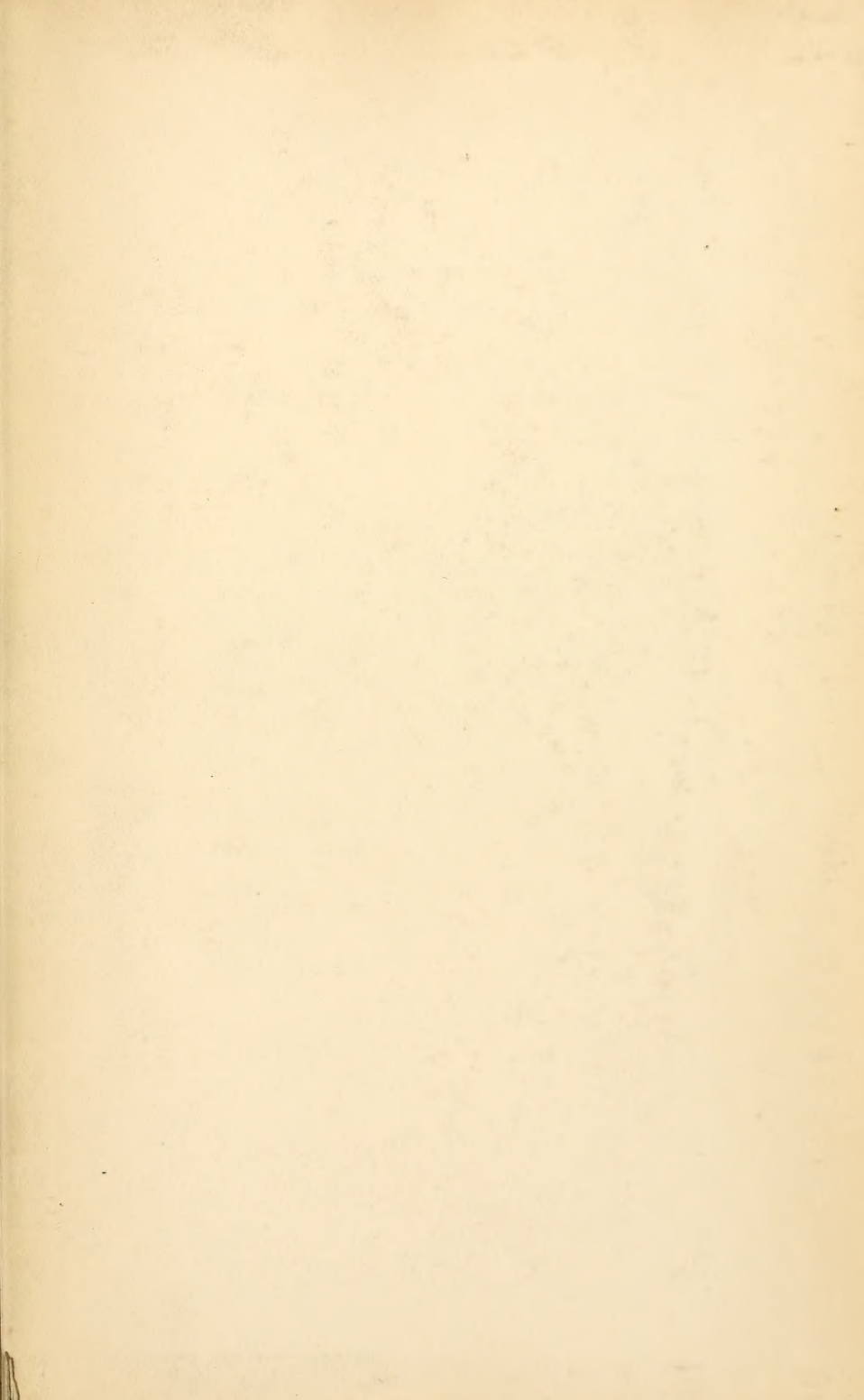
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